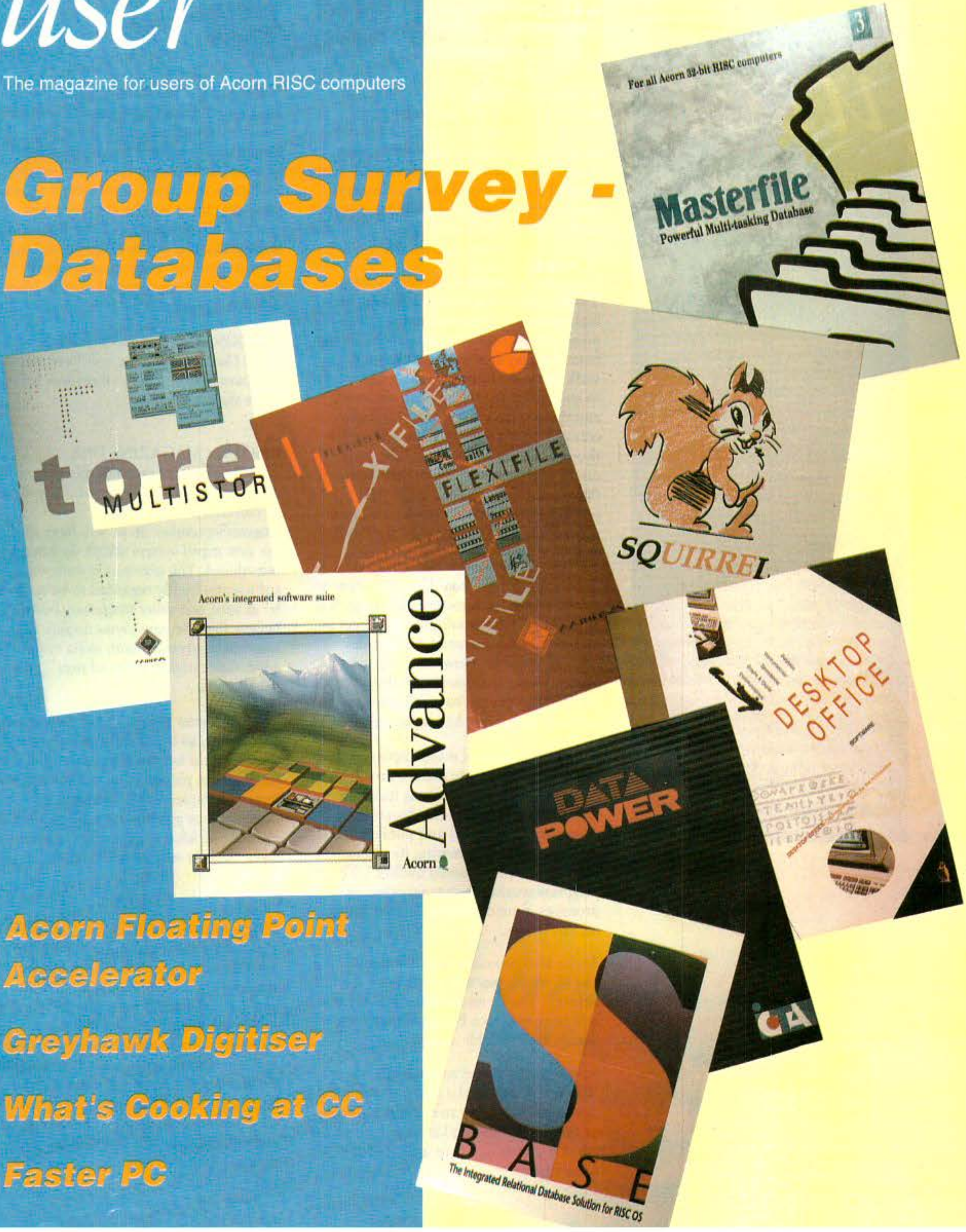
RISC user

OCTOBER 1993
Volume 6 Issue 10
Price £1.90

The magazine for users of Acorn RISC computers

Group Survey - Databases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OCTOBER 1993
VOLUME 6 ISSUE 10

RISC *user*

THE MAGAZINE FOR USERS OF ACORN RISC COMPUTERS

RISC User is published by
RISC Developments Limited.

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RISC Developments Ltd. ©1993
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ISSN 0966-1913

ACORN WORLD

As most readers will know by now, Acorn has decided to organise its own show this autumn, in place of previous Acorn User Shows, the new venture being entitled *Acorn World*. Acorn is keen to promote this event as something new, not only in the Acorn world, but in the world of computer shows as a whole.

According to Kevin Coleman, Acorn World's *Supremo*, Acorn is aiming for a high quality professional show which will present the world of Acorn to the visitor from the very first moment that they walk through the door. Acorn also wants to encourage families to visit the show and there is now a revised £15 family entrance ticket (if booked in advance), though I still believe that Acorn should discount the price of this ticket further if they really want to encourage the proverbial two adults and 2.4 children (actually up to 2 children on the family ticket).

As always, Acorn would like the show to appeal to the Archimedes enthusiast, but at the same time would like to attract as many new and potential Archimedes users as possible. However, organising a single show which can be all things to all users is a tough nut to crack, though I certainly hope that Acorn succeeds.

Apart from Acorn's main display area, there will be separate feature areas covering what Acorn sees as its most significant market areas: education, consumer (i.e. games) and publishing. Acorn has been promoting its platform as the focus of professional quality DTP and pre-press work in recent months, and promises a major display feature based on this theme.

Acorn also promises a games arcade "the like of which you will never have seen before". The *de rigeur* laser light show will be in evidence but again few other details are available as yet.

Acorn clearly hopes to establish *Acorn World* not only as the major event in the Acorn calendar, but to move the whole of the Acorn marketplace into a new gear when it comes to major events of this kind.

Nearly all the best known names in the Acorn market will have stands, and no doubt many software houses and hardware developers will be showing new products for the first time (see our feature in this issue). However, it seems clear that there will be no major new product announcements from Acorn - the anticipated top-of-the-range model will have to wait for 1994 - but no doubt there will be some new releases to whet visitor's appetites.

Both RISC Developments (publishers of RISC User) and Beebug will have stands at Acorn World where all readers will be more than welcome.

RISC User MAGAZINE DISC

All subscribers to our monthly magazine disc, and all other readers who purchased or received a copy of the August/September issue, will have seen the new menu system which we have introduced. The previous system was sufficiently highly regarded to be adopted by at least one other magazine, but we believe that the new menu display is a significant advance, both in its visual appearance and in terms of user friendliness.

The new menu system is still undergoing refinement, so if you have any comments which would help to improve it still further then please do let us know. If you haven't sampled the new format disc yet, then why not give it a try, and explore an example of what is generally considered to be the best magazine disc in the Acorn world.

WIMP PROGRAMMER'S TOOLKIT

This long established but still popular product is being updated. The number of applications has been increased, some applications have been replaced by newer and better programs, and the accompanying manual has been revised and enlarged to provide the best possible support for Wimp programmers, from beginner to the more expert. Full details are contained elsewhere in this issue, including details of a low-cost upgrade path for existing users.

M.W.

CONTENTS

FEATURES

Acorn World Show Preview 5
Group Survey - Databases 8
Educational Software at Home (Part 2): Mathematics 18
Nature's Way: Exploring Genetic Algorithms 24
Working with Images (Part 5): Colours and Palettes 30
Just a Page: Programs to Type and Use:
Basic Debugging Procedures
Some Simple Virus Protection 33
All About Outline Fonts (Part 2) 40
Wimp Topics: Using Features of RISC OS 3.10 47
The PC Emulator Survival Guide (Part 7) 50
Into the Arc: Integrating Draw and Paint 54
What's Cooking at CC? 62
C Notebook: Hints and Queries 64

UTILITIES AND APPLICATIONS

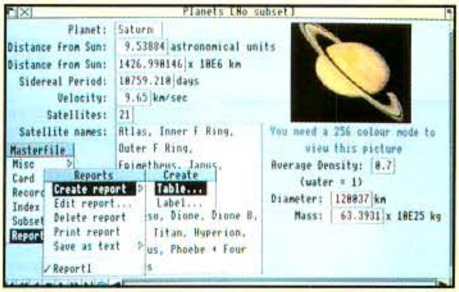
System Variable Manager 68
Template Information Utility 69

REVIEWS

A Keystroke of Good Fortune 16
Atomwide's RemoteFS 21
The New Acorn Floating Point Accelerator 22
Hawk or Dove:
Greyhawk Digitiser from Wild Vision 28
FirstLogo from Longman Logotron 35
Instant SCSI and CDSF: Atomwide's SCSI Adaptor 43
FasterPC: A Faster PC Emulator 44

REGULARS

News 4
RISC User Disc Contents 38
Hints and Tips 56
Write-Back 60
Points Arising 61
Technical Queries 66
RISC User Subscriptions 70
Classified Ads & Advertisers' Index 71



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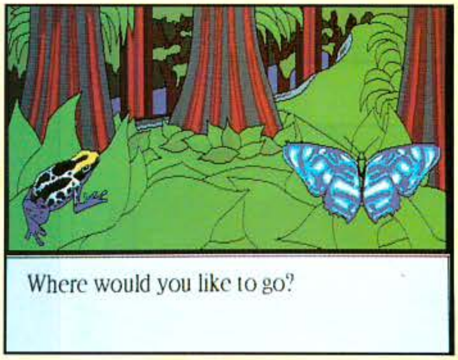
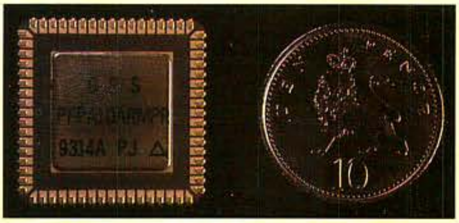
Database Group Survey page 8

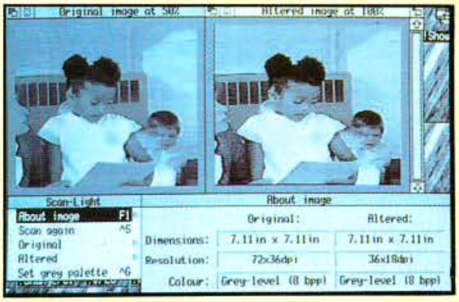


Where would you like to go?

Education page 18



Floating Point Accelerator page 22



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Greyhawk Digitiser page 28

News ...

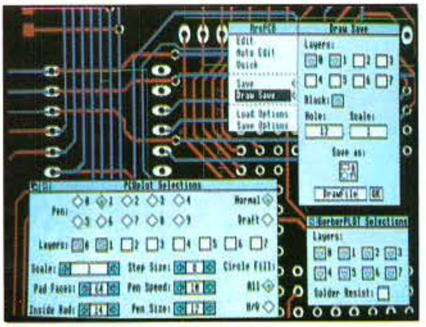
WORKS OF ARTWORKS

The results of Computer Concepts ArtWorks competition have finally been decided. Computer Concepts received some 700 entries, from which a shortlist of 30 was put to a democratic vote amongst their entire staff. The vote produced a winner and ten also rans. The winner was Mr W J Briggs of County Down, for his portrait of a Kingfisher. He collects a Canon BJC-800 colour printer, and the ten runners-up each receive £100 vouchers. A CD version of ArtWorks, containing all the entries, will be launched at the Acorn World Show. Computer Concepts were impressed by the quality of the entries and said it was extremely difficult to compile the shortlist, and that even the winning vote was very close. They are also looking forward to the next competition, so watch out for details.

FIRST GERMAN ACORN SHOW

The first computer show for Acorn computers will take place on the 18th and 19th September at Illertissen in Germany. The event is to be called Archicum, and exhibitors can contact Schneider & Scholz (the organisers) through Matthias Schneider at Schneider & Scholz, Reichenberger Straße 8, D-89257 Illertissen, or by phone on +497303 6150.

BETTER BY DESIGN



Silicon Vision have released their ArcPCB Electronic Design Automation tools. The system includes a multi-layer PCB design tool, and new RISC OS compliant versions of GerberPLOT and ExcellonDRILL, as well as the new PowerROUTER, providing full 100% rip-up retry routines and individual track width controls. The ArcPCB package includes the ability to cope with 32" by 32" boards and multiple layers with 0.001" resolution. The systems run on 1Mb machines and upgrade discounts from previous versions are available. The new packages are priced as follows: ArcPCB v1.8 £125, ArcPCB Pro v3.2 £275, ArcPCB v5.1 £375, GerberPLOT and ExcellonDRILL v2.1 £75 each and PowerROUTER v1.5 £195, all prices include VAT. For more information contact Silicon Vision at Signal House, Lyon Road, Harrow, Middlesex HA1 2AG, or on 081 422 3556.

LESS FOR MORE! ACORN'S XCHANGE OFFERS

A shocked Birmingham Acorn dealer is now the proud owner of a 30 year old Honeywell Bull computer. Bromsgrove lower school were given the machine by a local firm, and used it in a display of technology through the ages. As Colin Pickering, Head of IT at the school, explained "We found it very useful to demonstrate to children just how much computers have reduced in size and gained in performance over the years; but now that our display is finished, Acorn's Xchange scheme offers us the ideal chance to gain further benefit by trading it in against a brand new 32 bit RISC machine. While we will miss our mammoth exhibit, it was the size of my desk, the new Acorn system will fit neatly into just a fraction of that space!"

THE WORLDS FIRST SCAN-ITISER IS LAUNCHED

A new Computer Concepts/Wild Vision product combines the Computer Concepts Scanlight 256 greyscale scanner with the Wild Vision Greyhawk video digitiser on a single width expansion card. The 400dpi scanner combined with realtime grey scale digitising from any source offers a general purpose image capture solution from both printed matter and moving video sources.

A new version of the TakeOne previewer for the digitiser allows live previewing in a window on the Desktop at up to 50 frames per second. The Scanlight Video has an RRP of £220 ex.VAT and will be available from September. The price of the Greyhawk digitiser remains at £99 ex.VAT, and the Scanlight 256 hand held scanner costs £189 ex.VAT. For more information, Computer Concepts can be contacted at Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX, or on 0442 63933. A review of the Greyhawk Digitiser can be found on page 28 of this issue.

EDUCATION SOFTWARE FAIR

The Dorset Information Technology Advisory Team will be running a "software spectacular" to demonstrate the range of software available for the Archimedes. They will be at the Superchoice Centre, Osmington bay, Weymouth, Dorset on Friday the 17th and Saturday 18th September from 2.00pm until 8.00pm on the Friday, and from 10.00am until 3.00pm on the Saturday. Several major software houses have been invited to take part. It is hoped that the fair will be well attended, and that both parents and teachers will profit from an exchange of views on the subject of IT. For further information contact the IT Advisory team at Dorset IT Centre, Bovington Middle School, Bovington Camp, Wareham BH20 6NU, or call them on 0929 405059.

SHERSTON SOFTWARE ENTERS CRYSTAL MAZE

An Archimedes version of the popular Channel 4 adventure game show is to be released by Sherston Software at the Acorn World Show in October. Crystal Maze is being developed in conjunction with Chatsworth Television, the Channel 4 television company, and is being written in New Zealand. It will be priced at £34.00 ex.VAT and will have a similar format to the game show, with the four zones Aztec, Medieval, Futuristic and Ocean leading up to the Crystal Dome itself. Sherston Software can be contacted on 0666 840433 or at Swan Barton, Sherston, Malmesbury, Wiltshire SN10 0LH.

ACORN ON THE MOVE

Acorn has moved into its new hi-tech, purpose- built headquarters at Vision Park. This means that its operation, previously split between the Newmarket Road and Fulbourne Road sites, has been amalgamated at the new address which is: Acorn House, Vision Park, Histon, Cambridge, CB4 4EA. The current telephone and fax numbers remain unchanged. They are: tel (0223) 254254, fax (0223) 254262.

XENON 2 BLASTS ONTO THE ARC

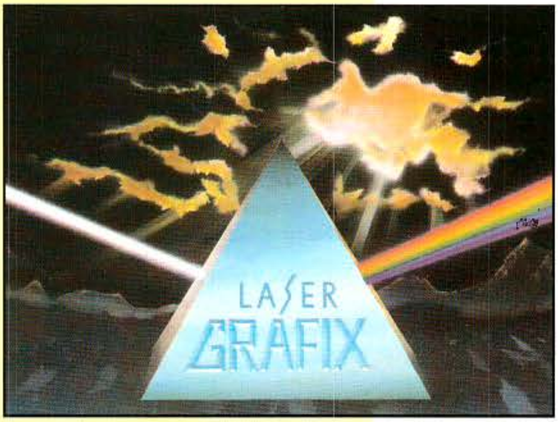
September sees the launch of Xenon 2, the first game from the GamesWare and Eclipse stable. Xenon 2 has been described as the definitive shoot-em-up and has enjoyed considerable success on the Amiga and consoles. The game will feature the high quality graphics, and one of the best ever soundtracks that the previous implementations sported. The Acorn version of Xenon 2 has been converted by Eclipse, with GamesWare handling the sales and marketing. Xenon 2 will retail at £25.99 inc. VAT and will be available from all good Acorn stockists or direct from GamesWare, who can be contacted on 0703 456523.

ACORN WORLD PREVIEW

In a little under two months, Wembley Exhibition Centre will be transformed into the Acorn equivalent of Disneyland.

The enthusiasm, excitement and interest that the new Acorn World Show is already generating is quite unlike anything that has occurred in the Acorn market before. This can be attributed to two things: firstly, the show is being organised by Acorn themselves, a very different company from the one we knew a year ago, and secondly, the entire Acorn market has undergone a major revolution during the past year. Acorn is no longer an unknown name outside the education sector.

Because of its ties to ARM Ltd, Acorn is now being associated in the national press with products such as Apple's Newton and the 3D0 multimedia/games system. With the appearance of very high quality, original games such as Aldebaran and Axis, and a flood of conversions from the "popular" formats, Acorn's computers are becoming very desirable games machines. In the professional publishing industry, the Acorn Desktop Publishing system is now viewed with respect as a



Watch out for the spectacular laser show

highly acceptable, fast and low-cost alternative to the traditional Macintosh and PC-based publishing systems; a result of Acorn's relationship with Computer Concepts, and equally important, Acorn's deals with companies like Kodak, AB Dick, and the software developer Digital Arts.

All of this bodes very well for the Acorn World Show, which Acorn are claiming will present a "totally new concept in computer shows". With a theme of "Vision for the future", Acorn's goal is to use the show to "present the diversity and future of Acorn to the visitor".

Acorn want to make the show as enjoyable as possible, particularly for families, for whom a special family ticket will be available. The show will have a creche, and loads of non-computer orientated entertainment for children, including magicians, jugglers and face painting. Other features to make the show more user friendly include 4M wide aisles and a very large restaurant area on the same floor as the exhibits.

One of the main features at the show will be the Publishing Area, a 70M stand where the visitor, both professional and casual, will be able to see Acorn publishing systems being used in a professional environment. Acorn, together with several other companies, will be demonstrating how their systems can be used by all sectors of the publishing industry, including graphic designers, bureaus, typographers and printers.

Another area that may be very interesting is the Concept Gallery, where the visitor will be able to catch a glimpse of the future. Acorn are being very reticent about what this will actually include, but it is being designed in conjunction with the Science Museum, who use Acorn systems in many innovative ways. The computer gurus from the Science Museum will be present at the show, demonstrating their in-house software and hardware, among other things. Also keep an eye open for a very realistic, talking, anamatronic robot.

The Education Centre is being targeted particularly at those involved in education in the greater London area, and will be showing many initiatives in the National Curriculum and special needs fields.

Certain to prove incredibly popular at the show is what Acorn claim will be "the best games arcade in Britain". With several of the top games companies now entering the Acorn market, and many of the best games being ported, including Xenon 2, SpeedBall 2 and Wing Commander, the arcade may hold more than a few surprises. Laser Grafix, the company behind the laser shows at Elton John's and Deep Purple's World Tour concerts, will be putting on a spectacular laser show in the arcade. Their control and projection systems contain "the ultimate computer power available - the ARM III processor"!

Amongst the exhibitors, companies to look out for include Kodak, ARM and Digital Arts. Kodak will be demonstrating their Photo CD systems, and possibly Acorn's Photo CD software. The show will provide the first opportunity for most Acorn users to see the new VIDC20 video controller from ARM, who will be showing off many of their latest developments, as well as third-party products that use them, such as Apple's Newton. Many of the exhibits will be using ARM technology that future Acorn systems could be based around. Digital Arts, whose deal with Acorn involves developing professional graphics design and publishing software, will, among other things, be hosting a seminar on photo retouching. The show's 150 seat theatre will be the venue for several seminars a day, ranging from Publishing for Professionals to Producing a pop CD.

This has just been a brief appetiser for the Acorn World Show. Next month we'll be able to go into a bit more detail about many of the new products that you'll be able to purchase, so you'll have enough time to arrange a suitably large overdraft with your bank manager!

Place: *Wembley Exhibition Centre, Hall 1*
Dates: *October 29 to 31*
Advance ticket prices: *Adults £5, Children £3, Families £15*
Ticket Hotline: *0784 483818*

SALLY SYSTEMS RECEIVES AWARD

The Institute for Social Inventions has just awarded its Communications Award for 1993 to Sally Systems. Sally Systems has been developing software to help dyslexic children to spell and read for some time now, and an Archimedes version of their DySpell package is due for release soon. A demonstration copy of the software is now available for teachers and parents. For this demonstration package or for further information contact Max Lipman at Software Assisted Learning, Upper Bumbles, Saxon Gardens, Taplow, Maidenhead, Berks SL6 0DD, or on 0628 24626.

ALMANAC RECEIVES UPDATE

Stallion Software are releasing a new version of the popular Almanac personal organiser application. The new version offers improved icons, advanced import and export facilities, including the ability to interact with Impression and RISC OS 3 printer drivers and export CSV files. Other features include new extendable notes, multiple telephone/fax numbers and support for FaxPack. The price has been held until the Acorn World show, and upgrades are free to existing users, who must return their disc to receive the upgrade. Not content with just one update, Stallion Software are also releasing version 2 of Lexicon the foreign language dictionary application, Version 2 now supports cloze testing and vocabulary testing. Existing users may once again obtain a free upgrade by returning their disc. Lexicon Version 2 is available in French, German and Russian. Assembler programmers will be pleased to hear that Stallion have now produced Assembler Help using StrongHLP. This stand alone program gives help on ARM instructions, floating point instructions, assembler directives, variables and macros. Assembler Help is priced at £15 ex. VAT. Stallion Software can be contacted at Arundel House, Arundel Road, Camden, Bath, Avon BA1 5JX, or on 0225 339090.

MINERVA GOES DUTCH

Having received a tremendous response to their CAD packages CADet and ProCAD, Minerva have been in touch with a Dutch specialist whose enthusiasm has resulted in the programs being translated into Dutch. Enthusiasm also abounds for a German version of each package, and negotiations are already under way. Minerva claims that ProCAD not only meets the AutoCad specification, but out performs it in both speed and advanced features. Minerva can be contacted at Minerva House, Baring Crescent, Exeter EX1 1TL, or on 0392 421762.

POCKET BOOK LINK INTO DESKTOP OFFICE

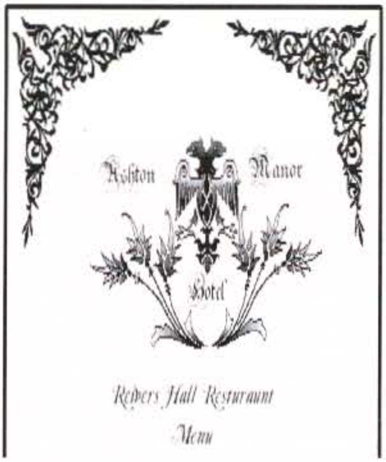
Minerva Software have announced a new version of their Desktop Office software that allows information to be exported directly to the Acorn Pocket Book via the A-Link. The software transfers data between the DTOBase and Pocket Book database program, or mail merges into DTOWord or create graphs from imported statistical databases. Desktop Office costs £79.95 ex.VAT, and Minerva can be contacted at Minerva House, Baring Crescent, Exeter EX1 1TL, or on 0392 421762.

SCANLIGHT 256 FOR WINDOWS

Computer Concepts are about to release their first product for the PC. It will be a version of their Scanlight 256, but with an interface board for IBM PC compatibles running windows. The system uses the same hand-held scanner as the Archimedes version, and gives true 256 grey scale scanning at 400dpi. The software offers similar functionality to the current Archimedes implementation. The package will cost £169 ex.VAT and includes the scanning head, interface board, software and manual. For more information contact Computer Concepts at Gaddesden Place, Hemel Hempstead, Herts HP2 6EX, or on 0442 63933

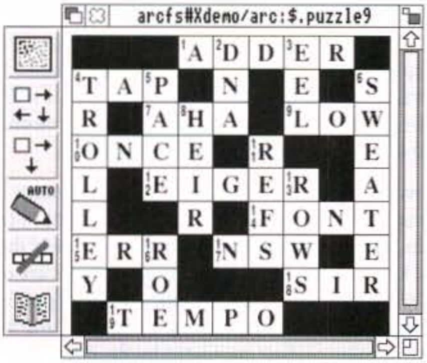
!FONTS, FONTS AND MORE FONTS!

The well known public domain library "The Datafile" have released a new package of Medieval & Gothic Fonts and Period Clip Art. The package contains 4 new fonts and a variety of Draw decorations for your files. The Datafile is now also licensed to supply all 60 ITC body fonts and the 450 family members as well as 20 ITC display fonts. In addition to this, The Datafile now has more than 60 LetrasetTM display fonts and a further 100 awaiting conversion. The cost is £10 for the first font, plus £5 for each family member supplied in a single package, ex VAT. This offers a quite substantial saving on the Macintosh price of £35.80 ex.VAT each. Thus a set for use on an Acorn system costing £54.64 would cost £286.40 The complete range is PostScript compatible and will retain their original licensed names. The Datafile can be contacted at 71 Anson Road, Locking,Weston-Super-mare, Avon, BS24 7DQ or on 0934 823005.



PANDERING TO CROSSWORD ADDICTS

Panda Discs have released a new Crossword authoring program called Xword. A demonstration version is available from them for £1.50 (or £2 if you want a high density version) The demo comes with a working version of XWord, an Acorn oriented adventure game and some clip art. For more information contact Panda discs at "Four Seasons", Tinkers Lane, Brewood, Staffs ST19 9DE, or call on 0902 850605.



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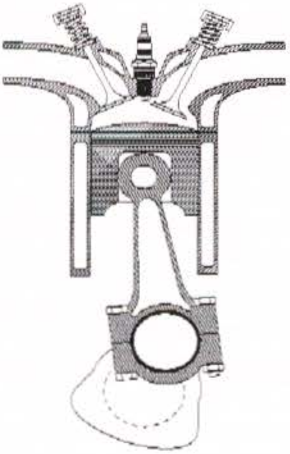
4MATION RELEASE HATCHBACK

Hatchback is a RISC OS application that allows the user to insert a variety of mono or colour fill patterns into Draw files in a similar fashion to Chameleon. It has nine different fill patterns with a variety of adjustable parameters, allowing an infinite number of variations to be generated. It is an ideal package for laser or dot matrix output, and it is claimed that it provides an excellent method for distinguishing separate items in complex mono Draw files. There is an example draw file from Hatchback on this month's magazine disc.

4Mation can be contacted at 14 Castle Park Road, Barnstaple, Devon EX32 8PA or on 0271 25353.



Group Survey - Databases

John Schild undertakes the massive task of examining ten RISC OS databases.

A database is any collection of information with some common linkage - data. It might be a telephone directory, a class register or even the weekly shopping list. It can be held in any medium from a mainframe to the back of an envelope. The computer provides convenient management of this data, which means that the application loosely referred to as a database is really a database management system, or DBMS. A system which can handle data from more than one "list" at a time is called a *relational* database, abbreviated to RDBMS.

The minimum DBMS might be thought of as an electronic card index, possessing four fundamental abilities - to create, search and sort records, and to output information in the form of reports. In the RISC OS domain, it would also be expected to be multi-tasking and screen mode independent. All the products included in this survey conform to these basic specifications, and in some areas exceed them. The ease with which these main tasks are accomplished as well as the number and nature of additional features will determine the appeal of any application to the individual user.

The *create* facility is fundamental. At this first stage of database building, the ease of laying out the record card, the number of field types which may be included, and the ability to use outline fonts and Desktop colours are of primary importance. A product will also be judged by the ease with which *search* criteria can be applied, and by the range of *sorting* options supported by the software. *Report* generation ranges in the applications surveyed from the simple creation of tabulated lists to complex document merging with a co-operating application such as Impression under the control of Computer Concepts' Impulse module.

As an addition to the default record design, some systems offer the facility to create views; different layouts of some of the record fields, possibly taken from more than one file. Most, but not quite all, DBMS packages allow data to be transferred between a database and other software as CSV (comma separated value) files. Other features offered by a number of programs include a facility for field calculations. Such features are identified as macros, expressions or formulae. Graph and chart drawing facilities are offered as integral elements by some systems and integrated packages.

The following survey and feature table lists the availability and user friendliness of these and other features in ten currently available database management systems.

Datapower - Iota Software

Datapower is new, innovative and perhaps the most powerful of the non-relational packages presently available. It comes lavishly packaged and provided with an adequate and usefully organised manual. An unusual form of piracy protection is included, which forms the subject of a later comment.

All the features of Acorn's Advance are present. There are also some useful enhancements. Formula fields are offered, allowing the mathematical operations denied to Advance users. A particularly attractive feature is external referencing, which also works on numeric fields. If, for example, the contents of two fields differ by the amount of VAT, the VAT rate may be held in an external directory as a simple multiplier available to all records. Thus a rate change can be made to ripple through all records with no measurable labour. Of similar value is the provision of multiple views. One of these, *spreadsheet display*, is very useful for

Masterfile III - RISC Developments

Masterfile III is a well specified product which has now entered the RISC OS domain. It comes simply boxed with a good, well-designed manual and useful ready-reference card.

It can best be described as a mid-range DBMS, with some useful features for the general user - perhaps of special appeal to Masterfile II devotees. Probably because of its origins, database design begins with the creation of a descriptor file. At this point, a selection must be made from a range of field types - text, integer, real number, date, date or time stamp, calculation, and graphic. Validation rules can be imposed, password security defined, and when the descriptor is complete it may be saved to a Filer window. The browser window then opens, and data may be entered. The default file can then either be accepted as is, or a new card designed including the same fields, which can be enhanced by the addition of colour, frames, and graphics

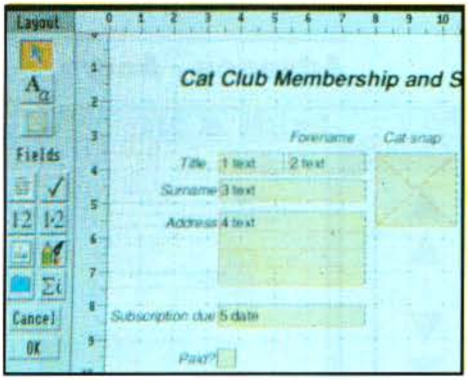
Desktop Office - Minerva

Desktop Office, originally reviewed in RISC User 4:1, is a suite of office programs - word processor, spreadsheet, charts, comms and database. It is supported by a well organised manual.

In its first version, the whole package was dismissed by reviewers as too slight; this criticism being levelled in particular at the database, which was seen as little more than an electronic card index, without adequate searching or reporting facilities. The second release has gone a long way towards meeting visual browsing and although almost universal in PC database systems, is probably unique to Datapower in RISC OS products. Like *Squirrel,* Datapower allows validation lists to be attached to all text and numeric fields for value entry validation.

Acorn have recently introduced a protocol for cut, paste and copy routines between co-operating applications, and this is implemented in Datapower. I could not persuade Impression 2.19 to take an interest, but the Impression-derived word processor in the Advance package co-operated enthusiastically. Datapower shares with *Multistore* and *Flexifile* my favourite party-piece. It will output telephone number touch-tones through the computer loudspeaker.

The verdict? Datapower is the most powerful of the non-relational systems in the survey. Although quite expensive, it may be counted as good value if the method of piracy protection is acceptable. The review copy arrived as a single-user version on a floppy disc containing the application and a software *key*, providing what I might call a single "credit". Any number of copies of the application and data files can be held on backup discs, but Datapower can be run only from the disc containing the credit. The credit can be moved between discs, but not copied. Thus, if it is left on a disc which fails, the application can no longer be run, and there is no remedy other than to appeal to the software house. My own judgement is that for the serious user this is unacceptable and Iota must think again.

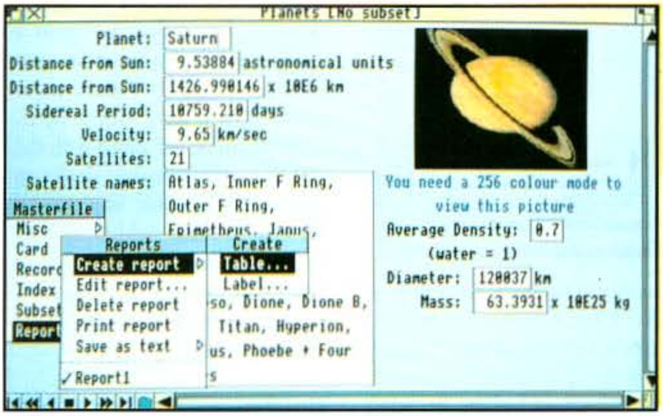


Easy card creation with Datapower

---

objects. The results can be very striking and attractive, though outline fonts are not employed. Once a card layout has been defined, only limited restructuring is possible.

Data can be manipulated using the familiar range of database facilities. Browsing tools are provided. A fast find procedure can be defined on any field, case sensitive at will, and with or without wildcards. Complex searches employing the whole range of operators can be initiated, and indices defined on up to three fields for record sorting. Both table and label reports are on offer, under the control of an easy-to-use dialogue box, allowing fields to be moved around or excluded at will, previewed on-screen and output to a printer under the control of a resident RISC OS printer driver.


Planets [No subset]

Planet: Saturn
Distance from Sun: 9.53884 astronomical units
Distance from Sun: 1426.990146 x 10E6 km
Sidereal Period: 10759.210 days
Velocity: 9.65 km/sec
Satellites: 21
Satellite names: Atlas, Inner F Ring, Outer F Ring, Epimetheus, Janus, …so, Dione, Dione B, Titan, Hyperion, …us, Phoebe + Four …s
You need a 256 colour mode to view this picture
Average Density: 0.7 (water = 1)
Diameter: 120037 km
Mass: 63.3931 x 10E25 kg

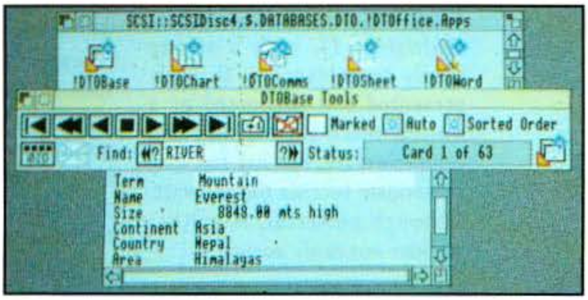
Working with Masterfile III to create a report

The verdict? Since this product is produced by our parent company, RISC Developments, we have to refrain from subjective assessments - though reviews in other magazines have been very positive.

---

these criticisms, and we now have a much more comprehensive data management system for the undemanding user. In particular, comparison operators can now be included in searches, and label printing is supported. Card creation is a little tedious but once accomplished, DTO database is generally friendly, if not exactly powerful.

I like the browse tools, and the ease of use of the quick search facility. Searching and sorting are adequately supported, and simple reports easy to generate once the basic rules have been learned.


SCSI::SCSIDisc4.$.DATABASES.DTO.!DTOffice.Apps

DTOBase Tools

☐ Marked ☐ Auto ☐ Sorted Order

Find: RIVER Status: Card 1 of 63

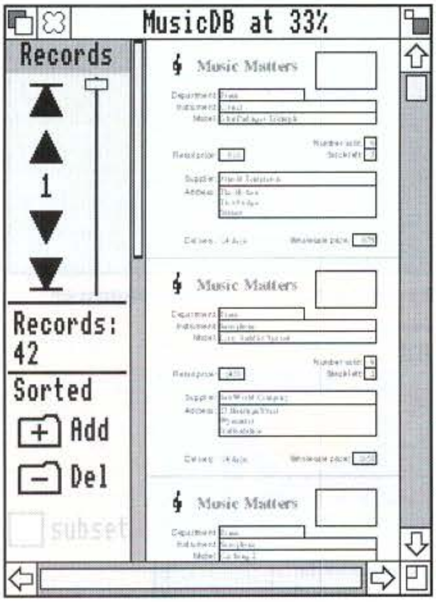
Term Mountain
Name Everest
Size 8848.00 mts high
Continent Asia
Country Nepal
Area Himalayas

Desktop Office database tools at work

Cards identified in searches can be "marked" for further attention but not readily extracted as subsets. Overall, my main criticism would be that although this package is aimed at the user with simple needs, it is not as easily learned as some of the more recent packages. A warm welcome must, however, be given to the inclusion of an *Alink* mode, to allow the swapping of CSV files with the Acorn pocket book.

The verdict? The present value of this package may not be rated as particularly high. It has to be judged in the light of the other similarly limited office tools in the suite, and the performance of more recent products in the same price range.

Advance - Acorn



Advance 'View all records' option

Advance database, reviewed in RISC User 6:6, forms part of Acorn's integrated office suite, comprising a word processor, spreadsheet and chart drawing program. It offers four significant pieces of software at a mid-range price for the non-specialist user. All the items are well specified, but, by design, limited in function. Upgrade paths to more advanced products are offered to purchasers at discount prices. The large manual covers all four applications, and is well designed as both a tutorial and a reference guide.

The Advance database is a reduced version of Iota's *Datapower*. Of special appeal to beginners will be its unusually friendly create facility, which allows the user to "paint" all the required fields, picked up from a tool panel and dropped into a record card design window with great ease, and then move them about into a pleasing layout. Records can be enhanced with the use of outline fonts, desktop colours and graphic objects. All the most familiar field types may be specified: date and boolean (yes/no), integer and real number, as well as graphics (both sprite and draw files).

Visual browsing of records is achieved with both backward and forward arrows, and a convenient slider. Multi-record viewing is also made possible in a special window, using the RISC OS scroll bars. Searching and sorting are very intuitive, and may be carried out on multiple fields using the familiar operators. Neither macros nor formulae are supported, making this less than ideal as a money management program. Report generation is not very comprehensive either, though headers and footers can be included with the usual row and column tables. In compensation for the lack of formula fields, sums, counts or averages of numeric field contents are automatically generated, and can be included in report formats. Address label printing is quite remarkably absent from the report menu, which might eliminate this otherwise useful package from some people's short list. Numerical values extracted from searches can be transferred directly into Advance's *chart* application.

The verdict? Advance database offers a good starting point for a first time buyer wanting a word processor and spreadsheet as well. If its limitations are acceptable at the outset, it must be good value as the first stage of an upgrade path.

Flexifile - Minerva

Flexifile is a reduced version of *Multistore II*, with a strong family resemblance. It is nicely presented and supported by a manual which is competent and comprehensive, but not too easy to navigate because the software, although powerful, is neither intuitive nor easily learned.

When I first examined Flexifile in 1991 I was impressed by the range of facilities offered, but found fault with a number of operations which were vital to the use of the package. These were accessed via such an obscure range of mouse operations and key strokes that it was necessary constantly to refer back to the manual for help. In particular I was disappointed by the lack of an intuitive feel to record card creation and the tortuous process involved. Once a card layout was designed and saved, life was much simpler, with file browsing, fast find and complex searching operations well supported, and powerful sorting functions ready to hand. An aspect of card creation which causes me some concern is that the size of a file has to be declared at the outset so that disc space can be reserved. This makes it quite difficult to alter the record and field specification after data entry has begun, as well as potentially wasting space. Key fields, necessary for the fast find operation also have to be declared at the creation stage.

Flexifile has some powerful features which must recommend it to particular group of users. Among these are the macro facility which allows complex mathematical operations to be carried out on numeric fields, and soundex searches, useful if you can't remember how a name is spelt. Another bonus is its (limited) relational capabilities. Two files may be open at once, a link established, and a report generated incorporating data from both files. Like Datapower and Multistore, Flexifile outputs telephone touch-tones.

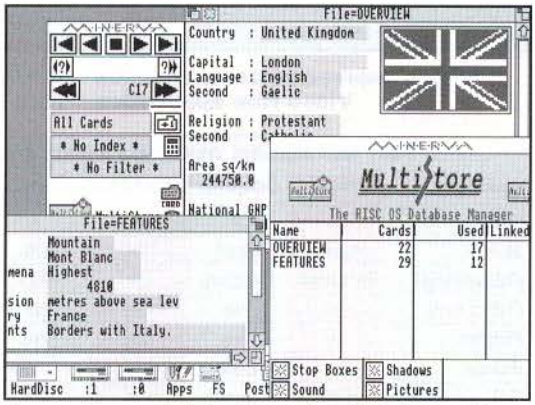
The verdict? At the price, the competition is probably too fierce for Flexifile to win an outright recommendation. It has too many tortuous paths to be easily learned, and rather few compensating virtues. Like Datapower, it is also burdened with a key-disc protection system.

Multistore II - Minerva

Multistore II, originally reviewed in RISC User 3:2, was the first relational DBMS running under RISC OS, and remained for a long time the uncontested leader in power and sophistication, admired for its formidable specification, but, I suspect, mostly from afar because of its inflated price tag. In its second release version, now offered at a lower price, it still has much to offer in the way of powerful search, sort and reporting functions, but shares many of the inconveniences already noted in the use of its junior stable-mate, Flexifile. The manual is very concise and condensed and quite indispensable to the operation of the software.

All the facilities of Flexifile described above are present, many in a more advanced form. The usual range of text and numeric field types are supported, including graphic types, but not date or boolean. Browsing is made easy by the use of what Minerva call "video" controls. Key fields may be designated, and the indexing of other fields for fast find operations is particularly sophisticated, and complex search criteria may be set up very conveniently. In addition to address labels, report types supported are designated as sheet or paged. The former are simple tables of selected field contents, with totals displayed at will for numeric fields. Paged reports allow for the inclusion of headers and footers, and the use of outline fonts to make the best use of printer page width. Relational reports can be generated as with Flexifile, but linking may be established between more than two files. In addition to Multistore's built-in report generating functions, it may be linked to co-operating software such as Impression, through Computer Concepts' Impulse module, to allow merging data from selected fields with specially formatted documents produced with Impression.

Multistore II shares Flexifile's limitations also. The *create* option suffers from the same problems as its counterpart; the process is complex and not easily learned. Outline fonts and Desktop colours are not available in the browse window, and file size has to be designated at the layout creation stage.



File=OVERVIEW

Country : United Kingdom

Capital : London
Language : English
Second : Gaelic

Religion : Protestant
Second : Catholic

Area sq/km
244750.0

National GNP

File=FEATURES

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Name	Cards	Used	Linked
OVERVIEW	22	17	
FEATURES	29	12	

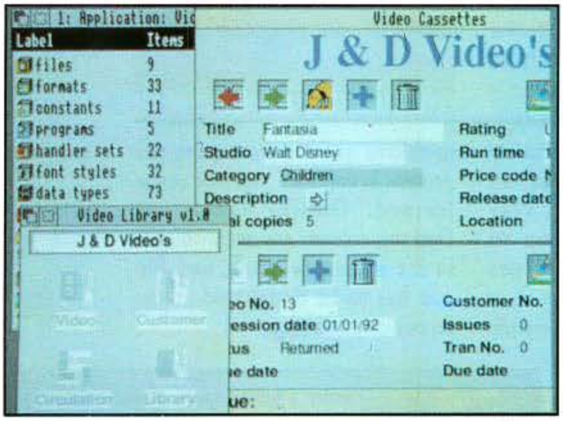
Accessing multiple files with Multistore II

The verdict? Multistore II is a functionally worthy package, impeded by some lack of programming flair in important areas. The consequence is that its powerful features do not deliver their best without much strain on the memory or thumbing of the manual. In a head to head confrontation with Squirrel, the most closely specified alternative, it can hardly be judged the winner.

S-Base Personal - Longman Logotron

S-Base Personal, reviewed in RISC User 6:6, is the entry level option from a range of three applications supporting the design of database managements systems. S-Base Personal is not a DBMS, but an application from which the user can build a database management system precisely to order. It arrives in a heavy box containing two massive manuals, one a tutorial, the other a reference guide for the Basic-like "S" programming language.

While most DBMS users probably wish to be protected from the code behind the desktop, S-Base allows users to make their own selection from a range of building blocks to create a database system wholly to their own specification. The cost is a much steeper learning curve, while the payoff is much greater flexibility. The heart of the package is the S programming language and its resources, such as window templates, which enable the patient user to design the total presentation, layout, and structure of a relational database management system.



Label	Items
files	9
formats	33
constants	11
programs	5
handler sets	22
font styles	32
data types	73

Title Fantasia
Studio Walt Disney
Category Children
Description
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Rating
Run time
Price code
Release date
Location
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S-Base's impressive demonstration Video Hire application

So innovative an application merits a detailed description outside the scope of this survey. The helpful review in RISC User 6:6 demonstrates that S-Base bears only superficial resemblance to the other applications surveyed here. From Advance to Squirrel, all are variations on the theme stated in my introduction, while S-Base is the statement of a quite new theme. Once basic competence is established it can be used to build a data handling system resembling others in the group, but in more expert hands it can also produce multi-screen systems for such tasks as stock control, circulation management and so forth.

The verdict? This is an interesting application which can eventually yield some very satisfying results. But be warned - its higher slopes are not for the novice climber, nor those to whom much study is a weariness of the flesh. Value for money cannot be judged relative to the other items in the review because of its obvious differences, but only from its unique potential in the right hands.

Ten database management systems compared, feature by feature

Application	Advance	Datapower	DesktopOffice	Flexifile	Impact	Impact Pro	Masterfile III	Multistore II	S-Base	Squirrel
Feature	1	2	3	4	5	6	7	8	9	10
Manual	Good	Good	OK	OK	Fair	Not seen	Good	OK	OK	Good
Create/design	Excellent	Excellent	OK	Poor	Good	Good	OK	Poor	See text	Good
Outline fonts	Yes	Yes	No	No	No	No	No	No	Yes	Yes
Pictures	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Browse	Good	Good	Good	Good	OK	OK	OK	Good	Yes	OK
Edit	OK	Good	OK	OK	OK	OK	OK	Good	Yes	OK
Simple Search	OK	OK	Good	Good	Good	Good	Good	Good	Yes	Good
Complex Search	Good	Good	Fair	OK	Good	Good	OK	OK	Yes	Excellent
Key fields/Indices	No	Yes	Single	Yes	Yes	Yes	Yes	Yes	Yes	Auto
Sort	OK	OK	Fair	Good	OK	Good	OK	Good	Yes	Good
Subsets	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Views	No	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Reports	OK	Good	Fair	OK	Impulse	OK	OK	Good	Yes	Good
Labels	No	Yes	Fair	OK	Impulse	Yes	Yes	Yes	Yes	Yes
CSV in	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CSV out	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Impulse	No	No	No	No	Yes	Yes	No	Yes	No	Yes
Calculations	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Relational	No	No	No	Yes	No	Yes	No	Yes	Yes	Yes
Charts	Yes	Yes	Yes	No	No	No	No	No	No	No
Password	No	No	No	No	No	No	No	Yes	?	No
Protection	Register	Key disc	None	Key disc	Register	Register	No	Register	Register	Register
Price (inc VAT)	£105	£160	£94	£94	£47	£76	£49	£152	£105	£140
Value for money	OK	See text	Poor	Poor	OK	Good	See text	Fair	See text	Good

Notes: The evaluative comments above, *Poor, Fair, OK, Good, Excellent,* represent my own subjective judgements.
Yes or *No* entries indicate whether a feature is present but offer no assessment of the quality of its operation.
The query in column 9 indicates that I could not discover from the documentation whether or not password protection is possible.

Impact - Circle Software

Impact is a mid-range, user friendly database, which, when it appeared a year or so ago, had a distinctly home-spun feel to its presentation, but was judged to offer value for money to a particular group - users of Computer Concepts' Impression. The manual was brief but in most respects, entirely adequate.

Impact's *create* facility has some similarities to the create feature admired in Advance and Datapower. Text, integer, real number, date, money and boolean fields may be dragged from a picker window to a card, and laid out at will. Fast or complex searches can be carried out, and sorting criteria can be applied. Sort orders and query filters can be saved and called up very easily for subsequent use.

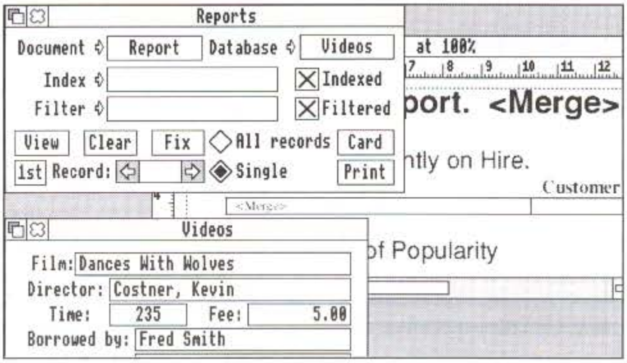
This is an application which performs well within its design limitations. One feature however, lifts it out of the commonplace. All report generation is achieved via Computer Concepts' *Impulse* module. The icon bar menu offers a merge option, giving access both to the database to be merged, and the Impression document into which the data is to be imported. This feature is somewhat marred by the less than adequate explanation of the merging process.

The verdict? Just about good value for money for Impression users, but probably not for others.

Impact Pro - Circle

Impact Pro is a grown-up version of Impact, and has only just appeared on the market: It provides all the features of Impact, with some enhancements. It has a wider selection of field types, including graphics, large numbers, and story - scrolling text windows. Calculation fields, employing a range of arithmetical functions, are also supported. Impact Pro possesses relational properties which, although I could not explore them fully, look to be very comprehensive and powerful. While still sporting the Impulse link, Impact Pro is provided with its own report generating facilities to give it greater appeal to a wider market and overcome the inevitable limitations of this reporting structure.

As the manual was not yet available when I wrote this, I was not able to investigate every nook and cranny. However, the application jumped effortlessly through all the hoops with which I was able to confront it.


Reports

Document: Report

Database: Videos

Index:

Filter:

☒ Indexed

☒ Filtered

○ All records

● Single

Videos

Film: Dances With Wolves

Director: Costner, Kevin

Time: 235

Fee: 5.00

Borrowed by: Fred Smith

Merging an Impact Pro report with Impression

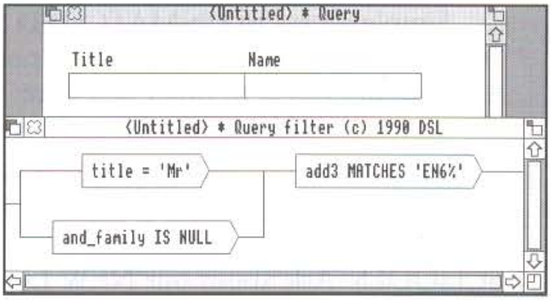
The verdict? This must necessarily be provisional, but, at the asking price, this is the cheapest relational database on the market and should meet the needs of many potential users. Circle Software will supply an evaluation copy which becomes fully operational once the registration procedure is completed.

Squirrel - Digital Services

Squirrel, reviewed in RISC User 5:5, was the first contender for the Multistore crown. It was designed from scratch for the RISC OS environment, and comes well packaged and with a useful second generation manual.

The *create* option was brand new and proved to be trend setting, allowing the "painting" of the record card from a series of icons in a tool box. Outline fonts and Desktop colours are available.

The range of field types is very wide - text, integer, real number, date, boolean, graphic, scrolling text, etc. Once created, record cards can be browsed, searched and sorted with ease, though I would mark Squirrel down on the lack of built-in browse arrows and a status window. All fields are automatically indexed, and when the browse window is scanned with any field selected, the alphabetical or numeric order of that window will be followed.


(Untitled) * Query

Title

Name

(Untitled) * Query filter (c) 1990 DSL

title = 'Mr'

and_family IS NULL

add3 MATCHES 'EN6%'

Squirrel's block diagram query filter display

The application can also sort fields into true alphabetical as an alternative to ASCII order.

Squirrel's strong suit is undoubtedly the provision of views (alternative presentation of fields in a user-designed window, taken if required from more than one file) and the very clever Structured Query Language (SQL) employed to construct queries and reports which may draw data from more than one file. Simple searches are executed by typing a string into a query window field, and executing the search. A subset will be created which can then be scanned or saved for further work. Complex queries can be generated either by typing values and comparison operators into query windows, or by opening a *show filter* window and dragging fields in, which results in the near magical generation of a block diagram representation of the query filter. This can be tweaked by rearranging the boxes and editing the text in them, and the query executed. When relational queries are being set up linking several files, this is the by far the most convenient SQL structure I have encountered.

The verdict? Not the cheapest, but probably the best relational database for handling complex queries on relational files, and providing versatile output options.

The reporting facilities of the first issue Squirrel were complicated beyond belief, but have now been replaced by some simpler defaults very much in the main stream of this survey group. The Impulse link has been retained, and once the rules have been thoroughly learned, add a useful dimension to this software.

CONCLUSION

In so closely matched a line-up, it is not easy to pick out the front runners. Candidates for a simple to mid-range system might usefully choose between Advance, with its bonus of word processor and spreadsheet, Impact, as an accessory to Impression, or Masterfile III.

Datapower justifies its starting price in terms of features and friendliness, but is hobbled by over-zealous piracy protection.

Among relational products, Squirrel strides ahead of the field with its *query* and *reporting* facilities, but with Impact Pro fast making ground.

It is impossible to offer odds on S-Base, which runs in a field of its own, but must have strong appeal to punters with the stamina and experience to build their own data management systems.

If YOU are thinking seriously about

STATISTICS

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RISC OS 2 and 3 compliant. Structured Menu System. "Spreadsheet" data entry. Simple access to UNMATCHED STATISTICAL FACILITIES. Drawfile output of Graphics. Ultra-easy import and export of CSV files giving smooth data interfaces to other software. Automatic, context sensitive Manual. Mouse driven with optional keyboard shortcuts.

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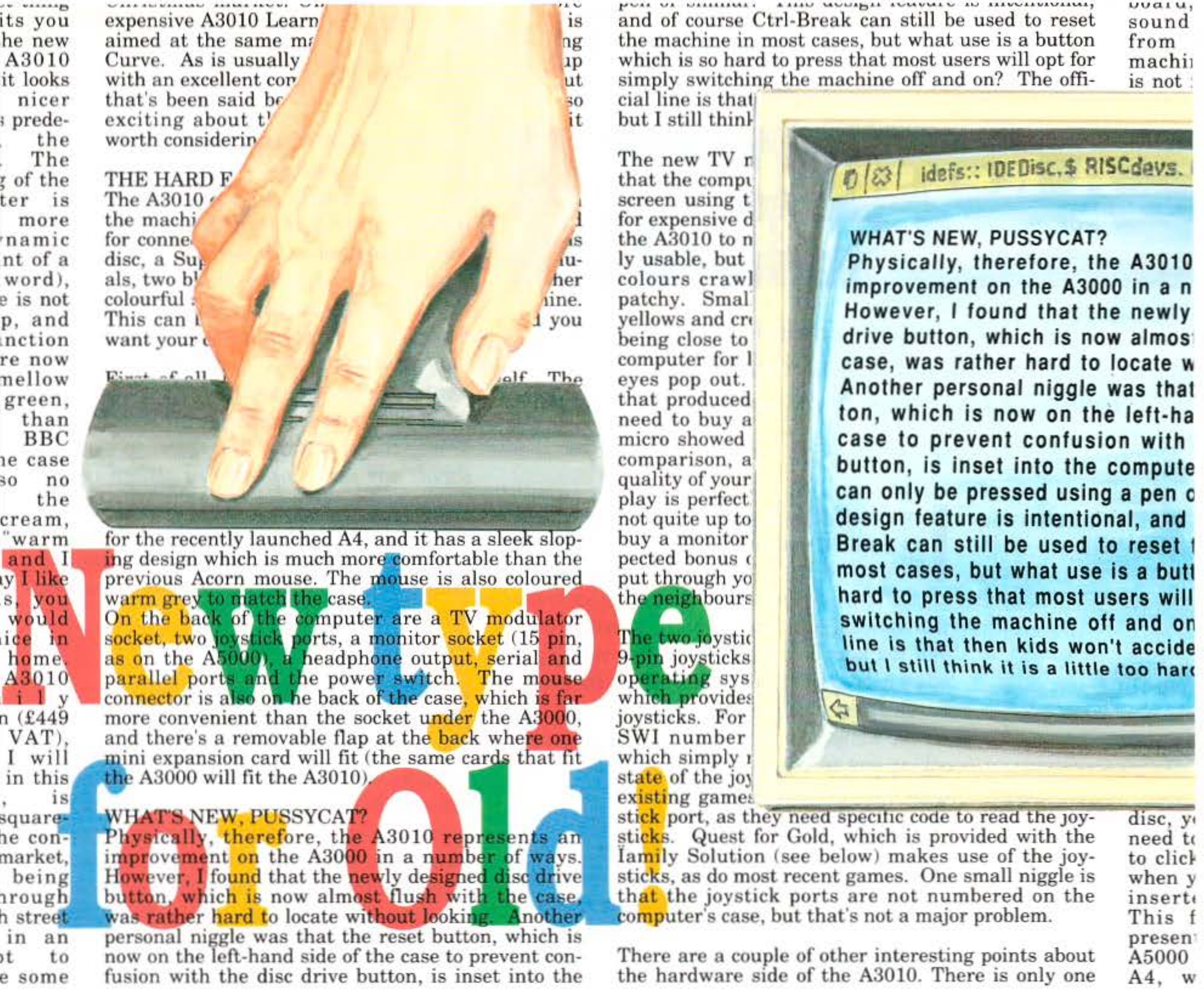

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First of all … elf. The
for the recently launched A4, and it has a sleek sloping design which is much more comfortable than the previous Acorn mouse. The mouse is also coloured warm grey to match the case.
On the back of the computer are a TV modulator socket, two joystick ports, a monitor socket (15 pin, as on the A5000), a headphone output, serial and parallel ports and the power switch. The mouse connector is also on he back of the case, which is far more convenient than the socket under the A3000, and there's a removable flap at the back where one mini expansion card will fit (the same cards that fit the A3000 will fit the A3010).

New type for Old!

WHAT'S NEW, PUSSYCAT?
Physically, therefore, the A3010 represents an improvement on the A3000 in a number of ways. However, I found that the newly designed disc drive button, which is now almost flush with the case, was rather hard to locate without looking. Another personal niggle was that the reset button, which is now on the left-hand side of the case to prevent confusion with the disc drive button, is inset into the

and of course Ctrl-Break can still be used to reset the machine in most cases, but what use is a button which is so hard to press that most users will opt for simply switching the machine off and on? The official line is that
but I still think

The new TV r
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stick port, as they need specific code to read the joysticks. Quest for Gold, which is provided with the Family Solution (see below) makes use of the joysticks, as do most recent games. One small niggle is that the joystick ports are not numbered on the computer's case, but that's not a major problem.

There are a couple of other interesting points about the hardware side of the A3010. There is only one

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WHAT'S NEW, PUSSYCAT?
Physically, therefore, the A3010
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case, was rather hard to locate w
Another personal niggle was that
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case to prevent confusion with
button, is inset into the compute
can only be pressed using a pen c
design feature is intentional, and
Break can still be used to reset
most cases, but what use is a butt
hard to press that most users will
switching the machine off and on
line is that then kids won't accide
but I still think it is a little too harc

Optical character recognition system

Sleuth is a new Optical Character Recognition (O.C.R.) package which converts human readable images of text into machine readable form. It processes a scanned image of printed material and converts it into an ASCII file which may be further processed using a text editor or word processor.

Sleuth is ideal for converting magazine articles, newspaper cuttings, legal documents, program listings, other resource materials etc. etc.

Sleuth v1.0 is a low-cost entry package into OCR and produces excellent results on a range of typefaces and sizes. It is the first in a planned family of products which will take OCR on Acorn machines to full professional level. Any future OCR products will be available as upgrades to existing users.

Sleuth is very easy to use - simply drag your scanned image into the input window, select the area to be converted and click to start. The ASCII conversion is displayed in the output window from where it may be saved. Sleuth is fully multitasking allowing you to correct any mistakes in the converted text while it is still converting the rest of the text.

Sleuth

Members Price
£41.65
+ £2 carriage + VAT

What Sleuth can convert
Sleuth has been trained with a popular set of fonts (including most PostScript fonts) and can handle type sizes between 9 and 24 point. Other fonts will work too, but with reduced accuracy. Sleuth v1.0 only recognises fonts in their regular styles i.e. not bold, italic, condensed, nor does it recognise accented characters.

Sleuth can achieve an accuracy of over 97% on recognised fonts using good quality 400 dpi scanned images, but the accuracy is reduced if the image is of poor quality or if the font is unrecognised. Conversion speed is between 80 and 250 wpm depending on the hardware in use.

For special applications, RISC Developments will consider training Sleuth on new fonts supplied by the user. A charge will be made for this service.

Equipment required
You will require a hand-held or flatbed scanner which produces mode 18 mono sprites. The minimum resolution required is 200 dpi, but for best results you need 300 or 400 dpi. Sleuth will run on a 1Mb machine, but for 400 dpi scanners we recommend a machine with 2Mb or more.

RISC developments

RISC Developments Ltd
117 Hatfield Road, St. Albans, Hertfordshire AL1 4JS
Telephone 0727 840303 Fax. 0727 860263

Please phone for a detailed specification, and for education and site licence prices.

A Keystroke of Good Fortune

Colin Murray reviews a powerful utility from Quantum Software that could be the key to improved productivity on your Desktop.

I'm sitting at my computer merrily typing into an Ovation document, when I inadvertently hit the Ctrl key while typing "a". It happens all the time, and seasoned Ovation users know the consequences. Ctrl-A means select all text, and the next character typed after marking a block indicates that you want to delete the block. Result - next time you look up at the screen you see the whole document marked, with a window asking you to confirm the deletion. Now you must take your hands off the keyboard, move the pointer over the NO icon and click, then carefully re-position the caret before you can continue - very frustrating when you are in full flow. You can use Escape to remove the window, but the text remains marked so as soon as you type again the process is repeated. But not any more! Now when I hit Escape, the window disappears and the marked block is cleared - all without touching the mouse or losing my position.

The phone rings. On hearing the fax tone, I glance at the icon bar and realise that the fax manager isn't installed. You know the rest of the story - you open directory viewers until you find the fax manager, double-click to install, open the menu and choose the Receive fax option ... by which time the machine on the other end has given up and gone home. But not any more! Now all I do is hit Alt-F, and the fax manager is installed and the correct menu option chosen without any further action on my part.

So do I have as-yet unreleased versions of Ovation and Fax Manager, or perhaps even a super new secret release of RISC OS that can read my mind? Not a bit of it! I'm simply using Quantum Software's Keystroke. Produce any computer, give it the most powerful and user-friendly operating system you can think of, and almost as soon as it's on the market a whole host of enterprising companies will be selling software that makes it even more powerful and user-friendly, providing facilities that make you wonder how on earth you managed without them before. Keystroke is just such a utility. Quite simply, it unleashes the whole power of the RISC OS Desktop from single keypresses, each of which can be user-defined. In other words, you can set up any key on the keyboard (on its own or in conjunction with Ctrl, Shift, Alt or any combination of the three) to perform almost any action or series of actions on the Desktop - opening windows or moving them to a specified position, clicking on icons, sending star commands (including running applications and loading files), choosing menu options, inserting text and so on.

USING KEYSTROKE

Everything you need to do to set up all your required keystrokes is controlled by the main window, which although fairly complex is laid out in a clear and logical way. The slim manual accompanying the software contains a tutorial which takes you through the process of creating keystrokes to perform actions such as opening a directory viewer on a disc in the floppy drive, popping up Paint's toolbox, inserting your name and address into a document, loading a file into Draw as well as installing a printer driver, and so on. Once you have worked through these, which should only take a few minutes, you should be able to think of, and implement, many other single-key shortcuts for all the regular actions you perform on the Desktop.

To give you some idea of its usefulness, let's go back to the two situations I described at the start. The Ovation problem requires two consecutive actions to overcome it. First of all you decide which key you want to use - I chose Escape - and then you program the two actions. The first is an icon click over the NO icon. Just drag a Drag to set icon from Keystroke and drop it over the NO icon in Ovation's warning window. Keystroke will remember the window and the icon (you can tell it to act on any window belonging to the task, or a specific window, or the one under the pointer). You then specify that a single click with Select is required. The second action is to clear the marked block. Ctrl-Z tells Ovation to do this, so all you do is tell Keystroke to insert text, and specify the string to be inserted as "|Z". From now on, whenever the Ovation warning window is open, pressing Escape will close it and clear the marked block.

Alternatively, you can tell Keystroke to re-define Ctrl-A to produce simply "a", and define another key sequence, say Alt-A, to replace Ctrl-A. Now you just press Alt-A instead to mark the whole text, and the problem caused by your finger slipping onto Ctrl will never occur again.

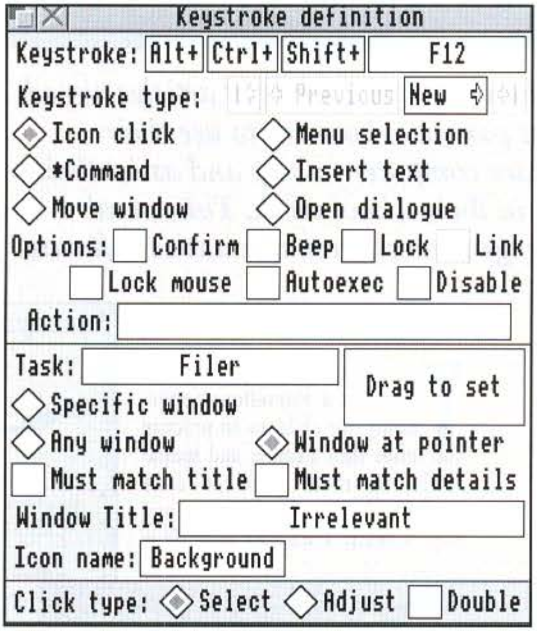
The second example is even more clever. Again it requires two actions, the first of which is to issue a Run command for the fax manager application. The second action is a menu selection. The menu option to receive a fax is the third item on the main branch of the icon bar menu, so you just tell Keystroke to select that item. If it was a submenu item that was needed, Keystroke can cope with this too, up to a maximum of 6 submenus. If the menu item leads to a dialogue box, a separate Keystroke function will handle this to enable you to keep the box open while selections are made.

OTHER FACILITIES

A number of options are possible when defining keystrokes. For example, a confirmation box can be displayed before the action is performed, or the position of the mouse can be temporarily locked while the action takes place. The *Autoexec* feature results in the chosen sequence of actions being performed automatically at specified intervals. This allows you, for example, to build an autosave feature for all those favourite applications that don't have one of their own. The manual describes how to do this.

A most useful feature, and one without which Keystroke would be little use, is the ability to save your key definitions for future use. They can of course be loaded back in at any time, but Keystroke goes one better: by inserting a line containing a special system variable into an application's !Run file, a specified set of keystrokes can be loaded at the same time as the application to which they relate.

The *insert text* function allows sets of macros to be built up, and text can also be collected from window title bars and icons to be inserted elsewhere, though other applications exist which perform both these functions in a more versatile fashion.


Keystroke definition

Keystroke: Alt+ Ctrl+ Shift+ F12

Keystroke type: Previous New

● Icon click ○ Menu selection

○ *Command ○ Insert text

○ Move window ○ Open dialogue

Options: ☐ Confirm ☐ Beep ☐ Lock ☐ Link

☐ Lock mouse ☐ Autoexec ☐ Disable

Action:

Task: Filer

Drag to set

○ Specific window

○ Any window ● Window at pointer

☐ Must match title ☐ Must match details

Window Title: Irrelevant

Icon name: Background

Click type: ● Select ○ Adjust ☐ Double

Keystroke's main window

Although Keystroke "interferes" with the normal operation of the keyboard and Desktop to some extent, using it should not cause any problems. Most actions are geared to a specific task and window or menu, and if they are not found Keystroke merely ignores the command. The only situations you need to treat carefully are where a keystroke intended for one application might be acted upon first by another application owning the input focus.

CONCLUSIONS

I'm usually very sceptical of manufacturers' hype, but Quantum's claim of "the best utility in the Archimedes world" might almost stand up in court. It all depends on your individual working practices, but if like me you have often fumed at the lack of keyboard shortcuts, and the way that opening windows and traversing endless menu trees hampers serious typing, then Keystroke was made for your icon bar.

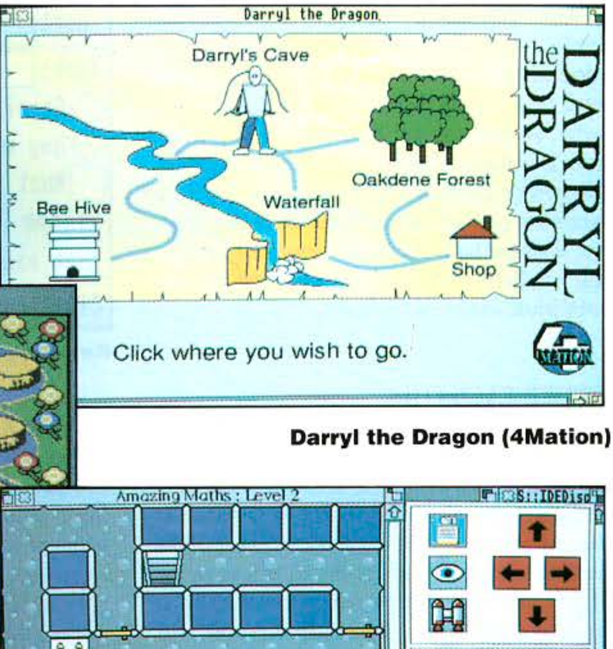
PRODUCT INFO

Product	*Keystroke*
Supplier	*Quantum Software* *35 Pinewood Park,* *Livingston,* *EH54 8NN.* *tel. 0506 411162*
Price	*£29.95 inc. VAT*

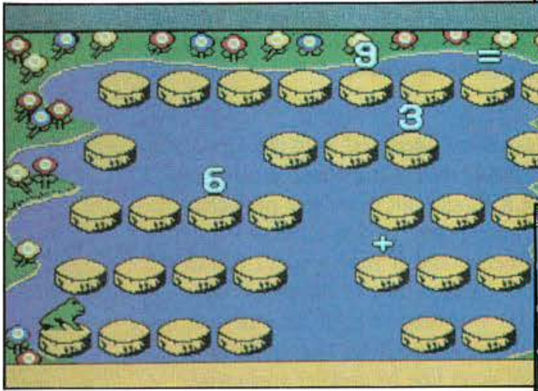
Educational Software At Home Part 2: Mathematics

This is the second in a series of articles aimed chiefly at parents who want to use their Archimedes computer to help and assist their children in their school work. This month Chris Drage focuses on mathematics software.

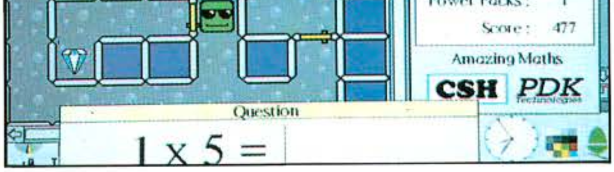
The home-based computer provides a marvellous opportunity for children to practice and refine their number and spatial skills, as there is more time available than in the classroom and help is nearly always at hand. It is also a fact that children really enjoy practising skills presented in the medium of a computer program; but one plea, as a teacher: please don't use an item of software if you know your child's teacher will be incorporating it into his/her programme. Keep it until the class has moved onto something else. Regarding the software itself, in the area of mathematics we are almost spoilt for choice, especially when it comes to primary aged children.



Darryl the Dragon (4Mation)



Fun School 3 (Europress Software)



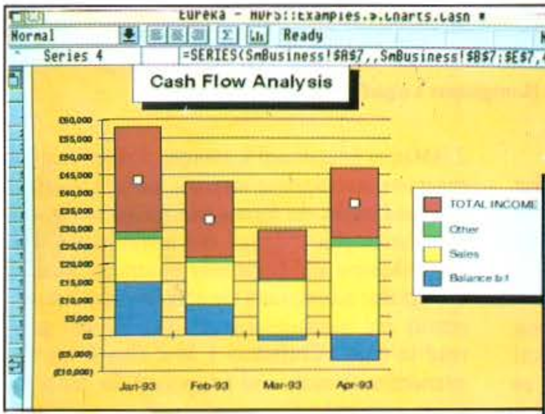
Amazing Maths (C.S.H)

NUMBER AND ALGEBRA

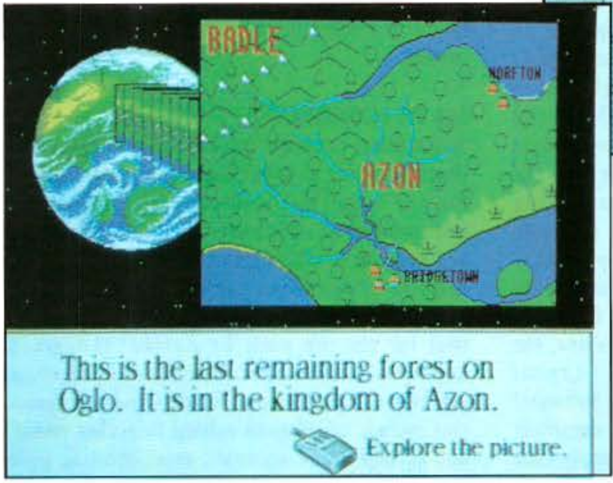
Sherston's *Animated Numbers* is perhaps the most delightful program yet for introducing reception class children to number. It provides activities highlighting both the cardinal and ordinal value of numbers to 10 couched in the most delightful animated graphics. Young children love this one! Another popular suite for the very young is *Maths Pack1* (H.S.Software) which covers matching, counting (backwards/forwards) and sequencing activities, and can keep records for up to 36 pupils. Children really enjoy the animated graphics and sounds. Another popular suite from the same stable is *Fun & Games* which covers a wide range of abilities and skills. Examples are sequencing and helping the child to devise and repeat patterns, matching, auditory and visual memory, money units and practising a range of skills including comparisons of different shapes and sizes, and prepositional statements like ..."put it on, under, behind, in front of". *Fun & Games* is ideally suited for home use. A favourite of mine is *Amazing Maths* (C.S.H.) which uses the maze scenario to give children practice with number operations and number bonds. With demons to avoid and diamonds to collect, and everything being totally configurable, *Amazing Maths* can challenge the whole family!

Two companies who specialise in software for home use are Triple-R Education and Europress Software.

Typically, their software is entertaining and skill oriented. However, this is in no way a criticism, for in the home, using the computer to enhance a child's skill level in any subject is very valid, and both publishers ensure their products relate well to the National Curriculum (N.C.). The former company market *Target Maths* (8-11 years - Key Stage 2), a very worthy suite of programs which I would thoroughly recommend, providing it is used in the context of practice and extension of number work that the child has undergone at school. The types of activities are well suited to the top of Key Stage 2 (K.S.2) and even K.S.3.



Eureka spreadsheet (Longman Logotron)



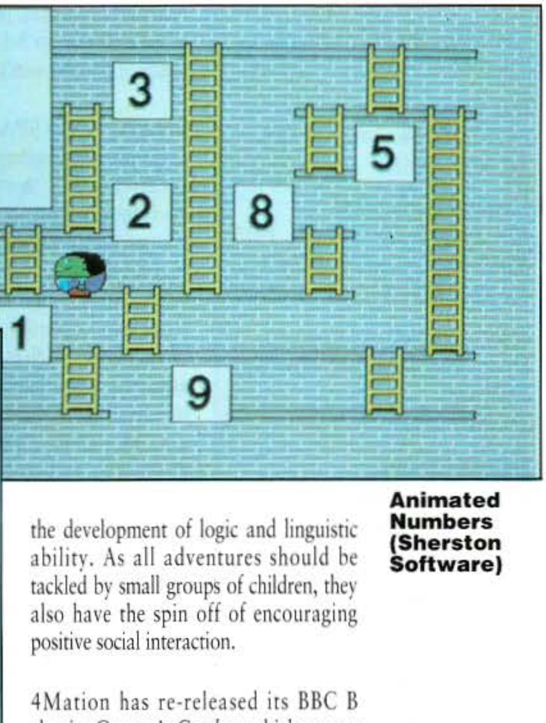
This is the last remaining forest on Oglo. It is in the kingdom of Azon.

Explore the picture.

Oglo (Sherston Software)

Europress Software is well known for its Fun School series, the latest of which, *Fun School 3* and *Fun School 4*, are suites of programs for under fives, 5-7 years, and 7-11 years respectively. Whether it's money, time, number or data handling games, the Fun School programs are animated, zappy and sure to interest even the most reluctant of learners. At a cost of £4.00 per game they represent good value for money.

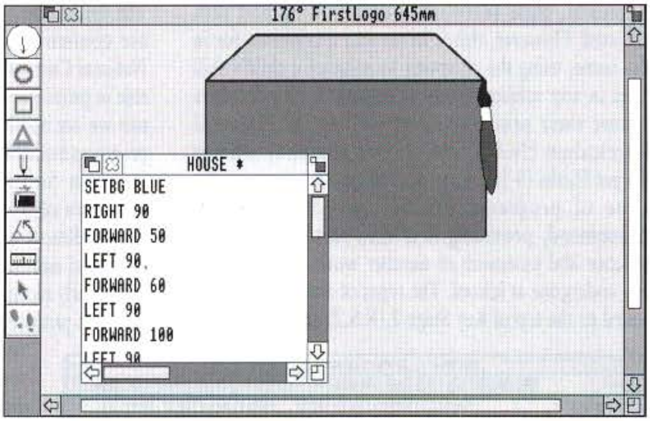
The application of number concepts and problem solving are common themes throughout the Mathematics National Curriculum, and the computer can play a major role in providing opportunities for problem-solving. Here too we are spoilt for choice, with excellent adventure programs available from 4Mation Educational Resources, Sherston Software and Storm Software. Among Sherston's offerings, *Wizard's Return* (8-11 year olds), *Animal Rescue* and *Toby At The Seaside* (both for 6-8 year olds) and *Space Mission Mada* (9-13 year olds) are particularly recommended. Animal Rescue also features a 'problem practice' section whilst *Toby* and *Space Mission Mada* offer a wide range of well presented mathematical problems. The value of adventure programs lies in their ability to motivate children to persevere with problem solving activities, to encourage the development of logic and linguistic ability. As all adventures should be tackled by small groups of children, they also have the spin off of encouraging positive social interaction.



Animated Numbers (Sherston Software)

4Mation has re-released its BBC B classic, *Granny's Garden*, which proves to be even better on the Archimedes. The superb, anti-aliased graphics and lovely animation make the first impact. Today's youngsters find the program just as entertaining and challenging as those a decade ago. An additional Granny's Garden Resource Pack is available which contains sets of Draw files which can be used in other applications. For children who are not quite ready for Granny's Garden's level of difficulty, *Darryl The Dragon* should prove an excellent stimulus. In this two-part adventure, children aged about 6-7 must make logical choices and see connections between related objects/situations. Some of the problems really test young children's numeracy skills and perseverance at the top level. Both programs can be thoroughly recommended for home use.

Among the latest problem solving software to appear is *Castle Of Dreams* (Storm Software) set very much in the mould of traditional computer adventures. Apart from the logic and strategies which must be applied, there is the added dimension of using compass directions and recording movements on paper. For a real challenge to 9-11 year olds, *Castle of Dreams* won't disappoint!



```
SETBG BLUE
RIGHT 90
FORWARD 50
LEFT 90.
FORWARD 60
LEFT 90
FORWARD 100
LEFT 90
```

FirstLogo (Longman Logotron)

PRODUCT INFO

For more information contact:

Cambridgeshire Software House,
7 Free Church Passage, St. Ives,
Cambridgeshire PE17 4AY.
Tel. 0480 67945.

H.S. Software,
FREEPOST, Swansea, SA2 9ZZ.
Tel. 0792 204519.

Longman Logotron Ltd,
124 Cambridge Science Park,
Milton Road, Cambridge CB4 4ZS.
Tel. 0223 425558.

4Mation Educational Resources,
Linden Lea, Rock Park, Barnstaple
EX32 9AQ.
Tel. 0271 25353.

Sherston Software,
Swan Barton, Sherston,
Malmesbury, Wiltshire SN16 0LH.
Tel. 0666 840433.

Europress Software Ltd,
Europa House, Adlington Park,
Macclesfield, Cheshire SK10 4NP.
Tel. 0625 879962.

Storm Educational Software,
Coachman's Quarters, Digby Road,
Sherborne Road, Dorset DT9 3NN.
Tel. 0935 817699.

Triple-R Education,
1 Percy Street, Sheffield S3 8AU.
Tel. 0742 781091.

Topologika,
P.O. Box 39, Stilton, Peterborough,
Cambridgeshire PE7 3RL.
Tel. 0733 244682.

SHAPE AND SPACE

Logo provides perhaps the most creative mathematical environment on a computer, so it's not surprising that it appears in the National Mathematics Curriculum. *First LOGO* (Longman Logotron) - see review in this issue - offers parents an attractive and stimulating means of encouraging their children to get to grips with 'turtle geometry', and to complement what is happening in the classroom. It offers young children the ability to create complex and appealing designs with the minimum of fuss and the maximum enjoyment. Once they are familiar with this one, the award-winning *Crystal Rainforest* (Sherston Software) provides a marvellous scenario in which children must apply their understanding of turtle geometry in order to solve the problems.

Several programs are available which encourage and challenge children to investigate patterns and other spatial relationships. Two excellent examples are *The Art Machine Pattern Book* (Topologika) and *Craftshop 1 & 2* (4Mation Educational Resources). Comprising five programs investigating weaving, pattern, bounce, tiling and tracks, the former package lies at the very boundaries of art, design and mathematics. The comprehensive and beautifully illustrated 'tumble' booklet that accompanies the pack provides 'action', activity and inspirational pages, and is a jolly good read in itself. Craftshop 1 & 2 also lie at the intersection of maths and art, possess the ability to rotate, scale and reflect complex patterns made from simple shapes, do curve stitching in both 2D and 3D, and tesselate patterns in 1, 2 or 4 tiles. An embroidery program allows 'embroidered' designs to be created using patterns formed by combining stitches.

DATA HANDLING

Spreadsheets are major educational software tools destined to play an increasing role in data handling for Key Stages 2-4, and are perhaps the least understood of all software, both in terms of function and the uses to which they can be put. If you can help your youngster understand and use a spreadsheet at home, well and good. A most suitable tool for the job must be *Eureka!* (Longman Logotron) if for no other reason than its excellent graphing and presentation features. Suitable topics may include calculations related to pocket money and savings (bank account), experimenting with times tables, primes, square and triangular numbers, adding VAT etc.

Lastly, two very good catalogues comprising comprehensive listings of Archimedes series educational software are:

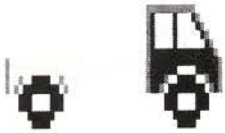
Acorn's Education Directory (Issue 4) and the *Educational Software Directory* (£1.00) available from BEEBUG Ltd.

Atomwide's RemoteFS

Reviewed by Lee Calcraft

RemoteFS provides a means of linking two or more Archimedes in such a way that files from one machine are made available on the Desktop of another. You can thus open a directory viewer on nominated directories of a remote machine, drag files from it, run distant applications, and so on.

Exactly what vehicle you use for file transport is largely up to you. *RemoteFS* comes in a number of versions. The simplest provides for the use of the serial or bi-directional parallel ports - and is the unit reviewed here. But there are also networking versions, and these can make use of both Econet and Ethernet.



The serial/parallel version comes with a 2m parallel cable and a 1.5m serial cable, together with a disc and 14 page A4 corner-stapled manual.

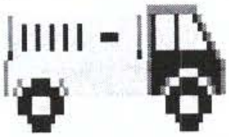
To use the parallel port version you will need two machines with bi-directional parallel ports - viz an A3010, A3020, A4000, A5000 or A4. The alternative is to use the much slower serial port (present on all Archimedes except the A3000, for which an upgrade is available).

SETTING UP

Although the manual is well written, it is not quite as easy to follow the first time around as it might be. This is partly because you can't just run the *RemoteFS* application on both machines, and then open remote directories. *RemoteFS*, even in its two-machine incarnation, works in a way which will be more familiar to network users. To set up a transfer you must first run the *RemoteFS* application on each machine, and use the icon bar menus to establish one machine as a server, and one as client, nominating which files or directories are to be offered to the client machine.

Once these have been made available, the *RemoteFS* icon on the icon bar on the client machine takes on the name of the item (directory or file) made available by the server, and the empty truck icon changes to one of a truck carrying a hard disc. Clicking on this opens a remote directory, just as if the *RemoteFS* icon was a filing system in its own right. The corollary of this is that if the server chooses to make a number of individual directories available, a new icon will appear on the icon bar of the client machine for each. And while this whole approach is probably ideal for client-server operations over a network, it is somewhat less intuitive when used on a two-machine setup - especially if you just want to transfer a few files from one machine on your desk to another.

On the other hand it makes it trivially easy to do much more than just copy files across. You can run applications directly from the remote machine, and can perform all normal file operations remotely - including file deletion etc.



In practice, once I had got used to the way in which *RemoteFS* works, I found it very easy to use. As expected, file transfer via the serial port was relatively slow. Using the 19200 baud top speed, a 50K file transferred in some 45 seconds. This test used ARM 3 machines at both ends, but turning the cache off had no effect on the timing, indicating that the bottleneck was at the serial port, as expected. Using the parallel port was much quicker, giving a time of just 9 seconds for the same file transfer.

Incidentally, when transfers are taking place, it is the receiving machine whose processor appears to be doing all the work, and although all operations multi-task, you are only left with a 1% time slice or so. As far as the server is concerned, however, there is no noticable degradation in Desktop performance during transfers, and indeed no sign that anything is happening. One slightly irritating point though, is that on the client machine the hourglass appears periodically even when there is no apparent activity.

PRODUCT INFO

Product	*RemoteFS*
Supplier	*Atomwide* *Unit 7* *The Metro Centre* *Bridge Road* *Orpington* *Kent BR5 2BE* *Tel. 0689 838852* *Fax 0689 896088*
Price	*Serial/parallel version £49 ex VAT Network version TBA (approx £199)*

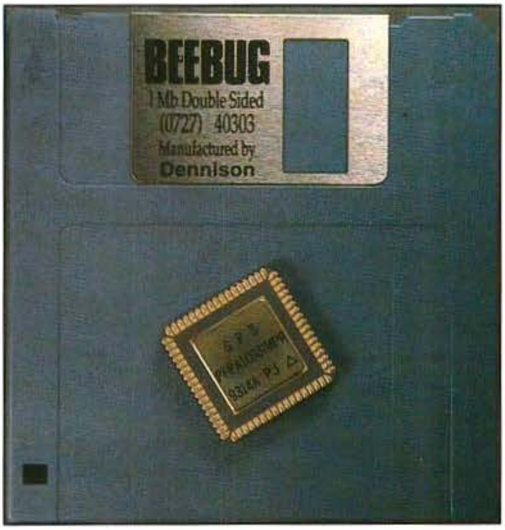
To conclude, this is an extremely useful package which will find a wide range of uses. Once you have come to terms with the client-server approach which it adopts, it is easy to use, and performed perfectly during tests.

The New Acorn Floating Point Accelerator

We have had to wait a long time for the promised ARM floating point accelerator. Now that the new chip from ARM Ltd has arrived, was it worth the wait? David Spencer investigates.

WHAT IS THE FPA?

As its name suggests, the floating point accelerator (FPA) is a lump of hardware designed to speed up the handling of floating point arithmetic - that is sums on numbers with decimal points in them. Without the FPA present, all the machine-code instructions that work on floating point numbers are emulated in software using the floating point emulator, which forms part of RISC OS. As some of the complicated operations, such as taking the sine of an angle, can take several hundred ARM instructions to complete, the floating point emulator is inherently slow. However, with the FPA installed, floating point instructions can be executed directly by the hardware, speeding things up considerably.



The ARM floating point accelerator chip

Following the RISC philosophy, the FPA doesn't attempt to execute every single floating point instruction. Indeed, only very simple operations such as add, subtract, multiply, divide and compare are implemented, with the remainder (such as sine, cosine, log etc.) being handled by a new version of the floating point emulator. This may seem a silly arrangement, but it has to be remembered that all the complex operations are ultimately implemented as a (long) sequence of simple arithmetic. Hence, the fact that the FPA speeds up simple arithmetic gives an inherent speed increase to all the more complex operations. Furthermore, by concentrating on just the simple operations, these can be made to operate very quickly - more so than if an attempt had been made to design the FPA to do everything directly.

Another trick of the FPA to improve speed is that it can operate asynchronously to the ARM. This means that once execution of a floating point instruction is started, subsequent standard ARM instructions can be executed immediately, without waiting for the floating point instruction to finish. Only when the ARM requires the result of an FP operation that hasn't completed yet does it need to wait for the FPA. Further speed-ups are also incorporated into the FPA, such as pipelining, which allows several instructions to be in different states of execution at the same time as each other.

For the technically minded, the FPA implements arithmetic operations as required by the IEEE 754-1985 standard, which is an international standard designed to give consistency between the arithmetic capabilities of different computers. Further details can be found in a data sheet, covering all the hardware and software aspects of the FPA chip, which is available for £10 (no VAT) from Acorn Direct, although this will be of no value to the average user.

COMPATIBILITY

The FPA is only compatible with ARM3-based computers, and then only those containing a socket ready for it. The A5000 and most A540s (and the R225 and R260 UNIX machines) fall into this category. For other machines, some third parties produce ARM3 cards with an FPA socket on them. The reason that the word 'most' is used in connection with the A540 is that some of the earlier versions didn't have a socket for the FPA. In this case, you have to send back to Acorn the processor card from the computer for a 'free modification'. In practice, this means a complete new processor card! Be warned though. The early A540s had an ARM3 running at 30MHz, whilst the new processor cards only run at 26MHz. So although floating point operations will be much faster, the machine as a whole will be slowed down a bit.

FITTING

How easy fitting the FPA is depends on the machine in question. If you are an A540 owner, it is relatively straightforward to slide off the lid, remove the processor card, plug in the FPA, which is a 68-pin square chip, and put everything back together. The A5000 fitting is a little more involved, as the FPA socket is underneath the hard disc drive. Therefore, the assembly of hard and floppy drives and podule backplane must be removed, which in turn necessitates removing any podules that are fitted. If you have a 400 series computer equipped with an 'FPA-ready' ARM3 card, then the fitting procedure will depend on the particular card.

Once the hardware installation is complete, the new floating point emulator module must be installed from floppy disc, and the system configured to load it at start up. All of this is fully documented in the supplied sixteen page user guide. If you wish to use the FPA with the RISC iX UNIX operating system, you will require some additional driver software, and this is available free from Acorn.

Once the new version of the floating point emulator is installed, no more intervention is needed - the FPA just starts working. Indeed, it is not immediately obvious if it's been installed correctly or not (though apparently the software won't load if the FPA isn't working).

USING THE FPA WITH BASIC

Before looking at the speed improvements offered by the FPA, it is vital to get one point straight - that is what applications will benefit from it. The short answer to this question is any application that uses the floating point instruction set, but as explained below, this doesn't necessarily mean any application that uses floating point operations. (One way to check is to look at the !Run files of applications and see if they *RMEnsure the emulator.)

There is an important exception - Basic V. Rather than using the defined floating point instructions, which are executed by the floating point emulator or the FPA, Basic V uses its own set of very highly optimised floating point routines. These routines are so highly optimised that I can remember talking to a mathematician a few years ago who had spent ages converting his programs from interpreted Basic to compiled C, only to find they ran substantially slower. In anticipation of the FPA, RISC OS 3 is supplied with Basic VI (as a file BASIC64 in the !System directory) which is almost identical to Basic V, but which uses the floating point instructions, and hence the FPA, if fitted. However, without an FPA, Basic VI is considerably slower than Basic V, albeit operating to a higher precision. The upshot of this is that whilst Basic programs that use floating point maths will be speeded up by the FPA (provided they are run under Basic VI and not Basic V), the gains will not be as great as for programs written in compiled languages.

HOW FAST?

At the end of the day, what really matters is how big a speed increase the FPA provides. You normally see the performance of floating point processors quoted in units of MFlops (megaflops), which signifies the number of floating point operations per second (in millions). ARM Ltd quote for the FPA a figure of between 3 and 5 MFlops - that is 3 to 5 million floating point operations per second. However, such figures should always be treated as little more than sales pitch, particularly with a complicated system like the ARM processor, where absolute instruction timings are very hard to obtain.

A much more reliable figure can be obtained by timing a number of operations, and the result of this is shown in the table below. Each test consisted of applying the specified function to the values 0 to 99 inclusive. Each test was repeated 10000 times, and the timings are in seconds for all 10000 runs. Figures are quoted for Basic V, Basic VI without the FPA, and Basic VI with the FPA. It may seem silly that no timings for assembler and C are given, but because the tests are so floating point intensive, the actual language used turned out to have very little effect. Indeed, the ratios of FPA to no-FPA for Basic VI and C were within 1% of each other. When looking at the figures, it should be remembered that Basic VI works to about 17 digits of significance, whilst Basic V's own routines are restricted to 10 digits.

Operation	Basic V	Basic VI (no FPA)	Basic VI (FPA)	Speed increase (FPA / no FPA)
X+X	26	91	21	x 4.3
X-2.5	18	50	15	x 3.3
X*X	27	95	21	x 4.5
X/3	25	104	16	x 6.5
SQR(X)	26	70	45	x 1.6
SIN(X)	58	308	45	x 6.8
TAN(X)	62	248	46	x 5.4
LOG(X+1)	72	235	56	x 4.2
EXP(X-50)	70	251	52	x 4.8

Timings in search for various maths operations (see text)

You can see that with the exception of the square root operation, the FPA provides a speed increase of between 3.3 and 6.8 times. The square root timings seem peculiar, because not only is the FPA only 1.6 times faster than the emulator, but Basic V is almost twice as fast as the FPA!

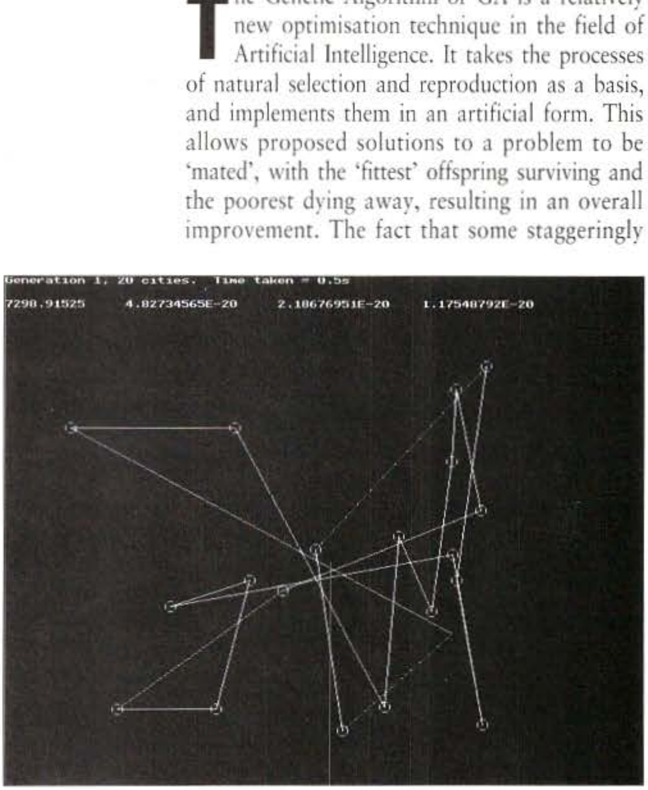
Obviously with real-life applications, the ratio of floating point to non-floating point instructions will be much lower than for the contrived examples used. Therefore, the overall speed increase will be watered down considerably. Having said that though, some applications that are notorious for using floating point arithmetic, especially CAD-type applications and certain spreadsheet operations, are likely to run at about twice the speed.

The FPA costs a very reasonable £99 ex. VAT and is available from all Acorn dealers, including Beebug.

Nature's Way: Exploring Genetic Algorithms

Steve Harris explains the new concept of Genetic Algorithms and how they can be used for problem solving on the Arc.

The Genetic Algorithm or GA is a relatively new optimisation technique in the field of Artificial Intelligence. It takes the processes of natural selection and reproduction as a basis, and implements them in an artificial form. This allows proposed solutions to a problem to be 'mated', with the 'fittest' offspring surviving and the poorest dying away, resulting in an overall improvement. The fact that some staggeringly efficient and ingenious biological solutions to problems faced in nature have evolved by similar paths suggests that this is a good method to use! The GA has a very wide applicability, probably even wider than the more well-known neural net; it has even been used to optimise nets and other GAs! Very powerful 'Parallel GAs' have been developed which run concurrently on several processors, exchanging information about the best solutions found. These increase the GAs inherent parallelism, and can produce excellent results even for problems that a standard GA finds difficult.



```
Generation 1, 20 cities.  Time taken = 0.5s
7298.91525     4.82734565E-20     2.18676951E-20     1.17548792E-20
```

The first totally random route for the travelling salesman

The GA has advantages over standard optimisation techniques such as calculus, exhaustive search and hill-climbing, as it can be used with discontinuous functions; it can cover huge areas of a search space quickly, soon avoiding unpromising areas; it doesn't need gradient information, and it can escape from a maximum when a better solution is found elsewhere.

We will examine the algorithm used by a standard GA, and follow this with an example Basic program to solve the famous 'Travelling Salesman' problem. You may like to type this program in now, or run it from disc, to see better what it is all about.

THE GENETIC ALGORITHM ALGORITHM

No, this is not a misprint! The first emulation of nature is in the concept of a population of individuals. In the GA, individuals (also called 'chromosomes' or 'strings') consist of possible solutions to the problem being optimised, in the form of an array of parameters such as the co-ordinates of a point in space, or in our example a list of numbers representing the order in which each of N cities are visited. At the start of the first 'generation', every member of the population is set up with random values, which gives an initially wide, even exploration of the problem's search space, allowing the GA to find the most promising areas quickly.

Each member of the population is then allotted a 'fitness' value, according to how good a solution to the problem it is. The fitness function is probably the most important part of the GA, and is instrumental to the GA's success: choose a bad fitness function, and you get a poor or completely wrong result - I know from experience! In our GA, the fitness is the reciprocal of the total tour distance to the power of *scale%* (see line 510). The reciprocal is taken so that the GA favours shorter total distances, and is raised to a positive power to increase the distinction between solutions of different qualities. Try changing the value of *scale%* to 1 and notice how the performance reduces since the GA finds it harder to distinguish good members from bad. Too high a value, however, causes the GA to converge rapidly on one of the first good solutions found, which reduces the wide-ranging nature of the search.

REPRODUCTION

Members are now selected on the basis of their fitness to undergo 'reproduction' to generate a new population. The selection method used is designed to ensure that the best members are always chosen, while the poorer ones also have a fair chance. See the book by Goldberg (reference at end) for a more detailed analysis of this and other selection methods. This selection by itself would produce an 'on average' better second generation, but no new strings will have been created. This occurs by 'mating' pairs of strings. Reproduction is sexual - two individuals are chosen and a random portion of the strings is swapped between them with a chosen probability to produce two new solutions to the problem. For example, two members might look like this:

(1 0 0 1 1 0 1 0 0 0 1)
and
(1 1 1 0 0 1 0 0 1 1 0).

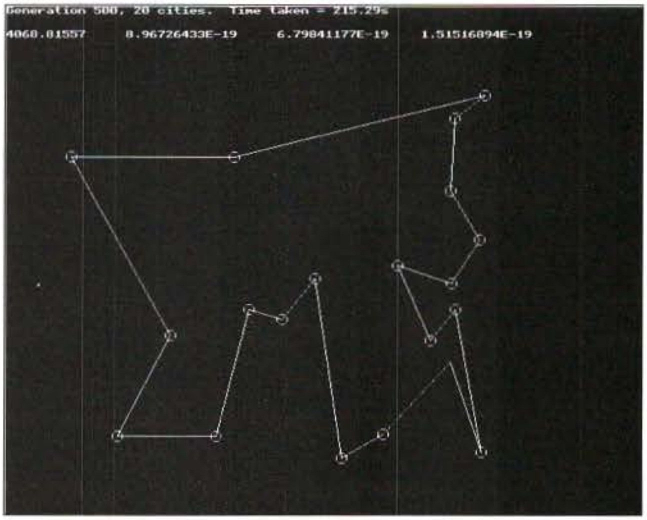
If these are crossed after the fourth position, the two new members will be:

(1 0 0 1 0 1 0 0 1 1 0)
and
(1 1 1 0 1 0 1 0 0 0 1).

The crossover probability *xprob* (see line 260) is usually fairly high, typically between 0.1 and 0.9, but the best value is problem dependent, and must be found by trial and error. The Travelling Salesman GA uses a special form of crossover known as *Partially Matched Crossover*, that ensures that only one visit to each city occurs. Since the better members of the population are selected, they will contain information about where the good solutions are to be found. One member might have a high fitness due to a good first half, and another due its second half.

The effect of crossover is to move this information around, usually producing one improved and one poorer solution. The improved solution will be selected for reproduction during the next generation, while the poorer one will probably be lost. This leads to a continued improvement in the best solution found towards the optimum value.

Like standard hill-climbing techniques, the GA can get stuck on sub-optimal local minima. To help combat this, the technique of mutation has also been borrowed from nature. In the GA, this involves changing a very small part of the population to a new value, in a random way. This forces the GA to look at nearby areas, thereby allowing it to 'escape' from the region to which it has converged, to even better solutions. Since this can be very disruptive, e.g. if high bits are changed, it only occurs at a very low probability, typically 0.005-0.05. A further reproductive technique is 'inversion', where a random portion of a string is reversed. This helps our Travelling Salesman GA by removing loops that increase the total distance travelled.



```
Generation 500, 20 cities.  Time taken = 215.29s
4060.81557     8.96726433E-19     6.79841177E-19     1.51516894E-19
```

A very efficient route calculated by the Genetic Algorithm

After reproduction has occurred, the newly created members' fitnesses are evaluated, the new population becomes the old, and the cycle repeats until the best solution is good enough or the maximum number of generations has occurred.

The actual code to implement these processes is very simple and efficient, with the fitness calculation being the major time consumer in most cases. Since random numbers are used extensively in GAs, the generator used should be statistically sound and have a long period; many C *rand()* functions are not - you have been warned!

THE EXAMPLE PROGRAM

The example program given tries to minimise the total distance of a tour passing through several cities. The co-ordinates of the cities are chosen at random, and the GA must try to find the best order to visit them to produce the shortest tour.

At the end of each generation, the maximum fitness is displayed, along with a display of the best solution in the population. At the start of a run, these will be poor, with the paths crossing often, but as time passes they will start to open out, until there are few or no crossings. You may notice that sometimes good solutions are lost for poorer ones - this is caused by reproduction disrupting the best solutions selected from the previous population. It can be prevented by using an 'elitist' GA, which keeps some or all of the best solutions from both the new population AND the old, ensuring that the best members always survive, but this can make it harder for the GA to find other, better maxima.

Typical start and end tours for 20 cities are shown in figures 1 and 2. The program is currently set to try 500 generations (line 130), but you can change this as you wish. As the generations progress, the current 'best' route is displayed graphically and constantly updated.

For a more detailed explanation of the workings of GAs, and for more advanced techniques to speed up convergence and avoid producing sub-optimal results, the 'GA bible' is *Genetic Algorithms in Search, Optimisation and Machine Learning* by D.A. Goldberg, which also contains the Pascal code for many GA routines.

```
   10 REM >SmallGA
   20 REM Version   A 1.0
   30 REM Author    Steve Harris
   40 REM RISC User October 1993
   50 REM Program   Subject to Copyright
   60 REM           Not Public Domain
   70 :
   80 ON ERROR PRINT REPORT$;" at line "
;ERL:END
   90 PROCinitialise : PROCget_fitnesses
  110 oldpop%()=newpop%() : PROCshowbest
  130 FOR gen%=2 TO 500
  140   PROCmake_new_pop
  150   PROCget_fitnesses : PROCshowbest
  170   oldpop%() = newpop%()
  180 NEXT : END
  200 :
  210 DEF PROCinitialise
  220 LOCAL left%() : @%=&0303
  230 SYS"OS_CheckModeValid",20 TO mode%
  240 IF mode%<>20 mode%=9 : MODE mode%
  250 IF RND(-TIME)
  260 xprob=0.4:mprob=0.025:iprob=0.2
  270 PRINT "GA for the Travelling Sales
man problem"''
  280 INPUT "How many Cities ";N%
  290 OFF : start% = TIME
  300 popsize% = 30   : REM must be even
  310 DIM coords%(N%,1), left%(N%)
  320 DIM oldpop%(popsize%,N%), newpop%(
popsize%,N%)
  330 DIM fitness(popsize%), fitscaled(p
opsize%)
  340 FOR n%=1 TO N%
  350   coords%(n%,0) = RND(900)
  360   coords%(n%,1) = RND(900)
  370 NEXT : newpop%()=0
  390 FOR m%=1 TO popsize%
  400  FOR n%=1 TO N%:left%(n%)=n%:NEXT
  410   FOR n%=N% TO 1 STEP -1
  420     use% = RND(n%)
  430     IF n%=1 use%=1
  440     newpop%(m%,n%) = left%(use%)
  450     left%(use%) = left%(n%)
  460   NEXT
  470   PROCnormalise(m%, newpop%())
  480 NEXT
  490 oldpop%()=newpop%() : fitness()=0
  510 scale%=3 : gen%=1 : ENDPROC
  520 :
  530 DEF PROCget_fitnesses
  540 bestm%=0:bestfit=0:worstfit=10
  550 fitavg = 0 : COLOUR 7
  560 FOR m%=1 TO popsize%
  570   PROCnormalise(m%, newpop%())
  580   dist=0
  590   FOR n%=2 TO N%
  600     dx = coords%(newpop%(m%,n%),0)
 - coords%(newpop%(m%,n%-1),0)
  610     dy = coords%(newpop%(m%,n%),1)
 - coords%(newpop%(m%,n%-1),1)
  620     dist += SQR(dx * dx + dy * dy)
  630   NEXT
  640   dx = coords%(newpop%(m%,1),0) -
coords%(newpop%(m%,N%),0)
  650   dy = coords%(newpop%(m%,1),1) -
coords%(newpop%(m%,N%),1)
  660   dist += SQR(dx * dx + dy * dy)
  670   fitness(m%) = 1.0 / dist
  680   fitness(m%) = fitness(m%)^scale%
  690   fitavg += fitness(m%)
  700   IF fitness(m%) > bestfit THEN
  710     bestfit=fitness(m%):bestm%=m%
  720   ELSE
  730     IF fitness(m%) < worstfit wors
tfit = fitness(m%)
  740   ENDIF : NEXT
  760 fitavg = fitavg / popsize%
  770 FOR m%=1 TO popsize% : fitscaled(m
%) = fitness(m%) / fitavg : NEXT
  780 ENDPROC
  790 :
  800 DEFPROCnormalise(m%,RETURNtour%())
  810 LOCAL ptr%, temp%()
  820 DIM temp%(N%): ptr%=FNfind(1, m%)
  830 FOR L%=1 TO N%
  840  temp%(L%)=tour%(m%,ptr%):ptr%+=1
  860  IF ptr%>N% ptr%=1
  870 NEXT
  880 FOR L%=1 TO N%:tour%(m%,L%)=temp%(
L%):NEXT
  890 ENDPROC
  900 :
  910 DEF PROCshowbest
  920 CLS : ORIGIN 120,0 : OFF
  930 PRINT"Generation ";gen%;", ";N%;"
cities."'"Time taken = ";(TIME-start%)/1
00;"s"
  940 PRINT''(1/bestfit)^(1/scale%);"
";bestfit;"  ";fitavg;"  ";worstfit'
  950 GCOL 1
  960 CIRCLEcoords%(1,0),coords%(1,1),10
  970 GCOL 7
  980 FOR n%=2 TO N%
  990   CIRCLE coords%(n%,0),coords%(n%,
1),10
 1000 NEXT
 1010 MOVE coords%(newpop%(bestm%,1),0),
 coords%(newpop%(bestm%,1),1)
 1020 FOR n%=2 TO N%
 1030   DRAW coords%(newpop%(bestm%,n%),
0), coords%(newpop%(bestm%,n%),1)
 1040 NEXT
 1050 DRAW coords%(newpop%(bestm%,1),0),
 coords%(newpop%(bestm%,1),1)
 1060 REM IF GET
 1070 ENDPROC
 1080 :
 1090 DEF PROCmake_new_pop
 1100 LOCAL chosen%()
 1110 DIM chosen%(popsize%)
 1120 numleft%=popsize% : baron% = 0
 1130 new1% = 1
 1140 REM Perform stochastic remainder s
election on the parent population,
 1150 REM to select the chromosomes to r
eproduce to form the next generation.
 1160 REM See Goldberg's book for detail
ed explanation of this technique. Those
 1170 REM selected are in chosen[].
 1180  FOR m%=1 TO popsize%
 1190    WHILE fitscaled(m%) >= 1.0
 1200    baron%+=1:chosen%(baron%)=m%
 1210    fitscaled(m%) -=1
 1220    ENDWHILE
 1230  NEXT
 1240  WHILE baron% < popsize%
 1250  m% = RND(popsize%)
 1260  IF fitscaled(m%) > 0.0 THEN
 1270   IF (RND(1)<fitscaled(m%)) THEN
 1280   baron% += 1:chosen%(baron%) = m%
 1300       fitscaled(m%) -= 1
 1310   ENDIF
 1320  ENDIF
 1330  ENDWHILE
 1340  REM Perform crossover and mutatio
n on pairs of strings selected at random
 1350  REM from those in chosen[].
 1360  REPEAT
 1370  new2%=new1%+1:use%=RND(numleft%)
 1390  old1% = chosen%(use%)
 1400  chosen%(use%)=chosen%(numleft%)
 1410  numleft% -= 1
 1420  use% = RND(numleft%)
 1430  IF numleft%=1 use%=1
 1440   old2% = chosen%(use%)
 1450   chosen%(use%)=chosen%(numleft%)
 1460   numleft% -= 1
 1470   FOR n%=1 TO N%
 1480     newpop%(new1%,n%) = oldpop%(ol
d1%,n%)
 1490     newpop%(new2%,n%) = oldpop%(ol
d2%,n%)
 1500   NEXT
 1510   IF RND(1) < 0.5 THEN
 1520     IF RND(1)<xprob PROCcrossover(
old1%,old2%,new1%,new2%)
 1530   ELSE
 1540     IF RND(1)<iprob PROCinvert(new
1%,new2%)
 1550   ENDIF
 1560   REM  Mutate bits with a probabil
ity of mprob.
 1570   IF RND(1) < mprob : SWAP newpop%
(new1%,RND(N%)),newpop%(new1%,RND(N%))
 1580   IF RND(1) < mprob : SWAP newpop%
(new2%,RND(N%)),newpop%(new2%,RND(N%))
 1590   new1%+=2:  UNTIL new1%>=popsize%
 1610 ENDPROC
 1620 :
 1630 DEF PROCinvert(m1%, m2%)
 1640 LOCAL i1%, i2% : i1% = RND(N%)
 1650 REPEAT i2%=RND(N%):UNTIL i1%<>i2%
 1660 IF i2%<i1% SWAP i1%,i2%
 1670 FOR L%=0 TO 1+(i2%-i1%)/2
 1680   SWAP newpop%(m1%,L%+i1%), newpop
%(m1%,i2%-L%)
 1690 NEXT : i1% = RND(N%)
 1710 REPEAT i2%=RND(N%):UNTIL i1%<>i2%
 1720 IF i2%<i1% SWAP i1%,i2%
 1730 FOR L%=0 TO 1+(i2%-i1%)/2
 1740   SWAP newpop%(m2%,L%+i1%), newpop
%(m2%,i2%-L%)
 1750 NEXT : ENDPROC
 1770 :
 1780 DEF PROCcrossover(old1%,old2%,new1
%,new2%)
 1790 xpt1% = RND(N%)
 1800 REPEAT xpt2% = RND(N%) : UNTIL xpt
1% <> xpt2%
 1810 IF xpt2%<xpt1% SWAP xpt1%,xpt2%
 1820 FOR n%=xpt1% TO xpt2%
 1830   SWAP newpop%(new1%, n%), newpop%
(new1%,FNfind(oldpop%(old2%,n%),new1%))
 1840   SWAP newpop%(new2%, n%), newpop%
(new2%,FNfind(oldpop%(old1%,n%),new2%))
 1850 NEXT
 1860 ENDPROC
 1870 :
 1880 DEF FNfind(city%, m%)
 1890 LOCAL c% : c%=0
 1900 REPEAT
 1910   c%+=1
 1920 UNTIL city%=newpop%(m%,c%)
 1930 =c%
```

Hawk or Dove

Alan Bonsor examines the new GreyHawk video digitiser - a product that is certain to put some colour into your life.

Computer Concepts acquisition of Wild Vision is proving to be a godsend for anyone interested in video digitising. Wild Vision are renowned for their range of video digitisers, but their excellent hardware products have almost invariably been let down by unexciting and limited supporting software. Now everything has changed!

GreyHawk is an 8-bit, 256 greyscale, real-time video digitiser. It's neither the first nor the cheapest, so what makes it stand out from the crowd? The answer is simple - its software. GreyHawk is the first digitiser to be supplied with a professional, user friendly, image enhancement application.

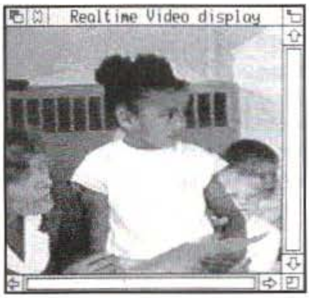


Figure 1
The TakeOne realtime display

The software in question is *ScanLight Plus*. Written by Computer Concepts to complement its ScanLight range of hand-held and flatbed scanners, *ScanLight Plus* has now been extended to interface directly with the GreyHawk digitiser. The resulting product is very impressive.

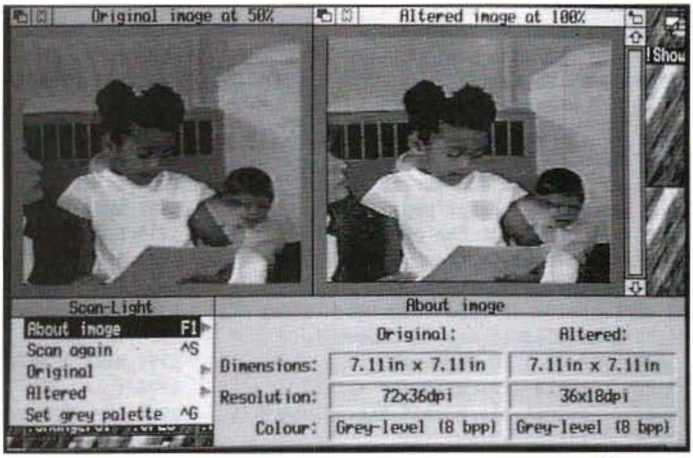
THE HARDWARE

The GreyHawk video digitiser is a half-width expansion card for the Archimedes range, the A3000 and A5000 (a micropodule version is under consideration). It provides a single BNC connector, and can be connected to any PAL composite source, including a VCR, camcorder or digital camera such as the Canon Ion.

The card is sparsely populated but well made. It consists of a XILINX programmable chip, allowing digitising at different resolutions and aspect ratios, 256K RAM frame store, an EPROM containing the controlling software, and a smattering of surface mounted components.

INSTALLATION

If you're into masochism, you could get away with using GreyHawk on a 1Mb, single disc drive system; 2Mb and a hard drive are strongly recommended.



	Original:	Altered:
Dimensions:	7.11in x 7.11in	7.11in x 7.11in
Resolution:	72x36dpi	36x18dpi
Colour:	Grey-level (8 bpp)	Grey-level (8 bpp)

Figure 2
The original and altered windows

Installing the card couldn't be simpler. Just plug it into an empty expansion slot. Two applications are supplied on disc. The first is *ScanLight Plus* and the second is *TakeOne*, the realtime display software, also written by Computer Concepts. Copy them onto your hard drive and the installation is complete.

IN USE

Both applications are a pleasure to use. Clicking on the TakeOne icon opens up the *Realtime video display* window, in which a moving video image is displayed at up to 25 frames per second. If a graphics accelerator card is present, using a 256 greyscale palette mode gives a live display of TV quality. Under standard 256 colour modes the image can appear to be grey-banded (figure 1). This does not affect the end quality of the image as *ScanLight Plus* grabs directly from the card. The review version of *TakeOne* did not provide brightness or contrast controls for the live display, but these features should be available shortly.

Clicking on the *ScanLight Plus* icon opens up the *Scan Dialogue* window. The default digitising resolution is 512 by 256 (72 by 36 dpi). Computer Concepts is currently working on a software upgrade module that will offer full 512 by 512 resolution.

To grab an image, just click on OK. The digitised image appears in the *Original* window almost immediately, and is automatically dithered to emulate 256 greyscales in standard RISC OS modes.

ScanLight Plus uses two windows to display the current image. Double-clicking in the *Original* window opens up the *Altered* window (figure 2). All image processing is performed in this window, and the results are non-cumulative. Any enhance option that you use is always applied to the original image, but displayed in the altered image. You can thus experiment with the various settings for each enhance option, and only when satisfied with the results do you need to replace the original image with the altered one.

ScanLight Plus provides a wide range of image enhancement and manipulation functions. They are all accessed through the *Toolbox* window (figure 3), through which the image can be sampled, rotated by any angle, and have its contrast, brightness and grey-map modified.

A very serious bug was present in the review version of *ScanLight Plus*. If an image was rotated by 45, 135, 225 or 315 degrees, a fatal *Division by zero* error occurred. Computer Concepts is aware of this bug.

CRITICISM

One of the best features of *ScanLight Plus* is that it can be used to enhance any Sprite file, not just images grabbed directly from the digitiser. However, it is with regards to this feature that I want to make my first criticism, a criticism which can be applied to most Acorn/Archimedes software, not just *ScanLight Plus*. *ScanLight Plus* does not provide any support for foreign image formats such as TIFF or GIF. With Acorn products increasingly being used as professional 'tools', it is no longer acceptable for software developers to expect users to turn to third-party software such as *Translator* or *ChangeFSI* to translate images from one format to another.

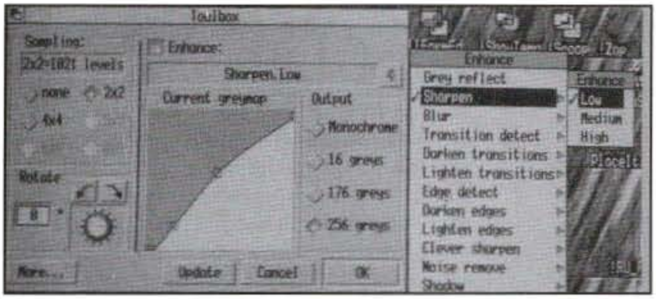


Figure 3
The ScanLight Plus toolbox and menu

Also related to the above is the use of the RISC OS 3 *Squash* module. All graphics related applications should start providing support for this module, especially considering the amount of hard drive space that digitised and scanned images require.

The only other possible criticism is that, if compared to image processing software such as *AIM*, *ScanLight Plus* offers relatively few enhancement filters. However, those that it does provide work very well, and the whole package is very easy to use.

PRODUCT INFO

Product	*GreyHawk*
Supplier	*Wild Vision Ltd* *15 Witney Way* *Boldon Business Park* *Boldon Colliery* *Tyne and Wear* *NE35 9PE* *Tel. 091 5191455* *Fax. 091 5191929*
Price	*£99.00 ex. VAT* *(introductory price)*

CONCLUSION

As you have probably noticed, I haven't really found much to criticise about GreyHawk and *ScanLight Plus*. Printouts of digitised and enhanced images have elicited a range of ooh's and aah's and other complimentary comments. The whole package is of a very high standard, and considering the price, an absolute bargain.

Working with Images

Part 5: Colours and Palettes

by Lee Calcraft

Most image work on the Archimedes is confined to the use of the 256 colour modes (such as mode 15, 21 and 28): working with just 16 colours, even though they may be selected from a palette of 4096 proves in most cases to be too restrictive. But even the 256 colour modes impose massive restrictions on what may be achieved. In this final part in our short series, I want to take a look at colour handling and representation in the 256 colour modes.

GCOL AND TINT

In a 256 colour mode there are (obviously) just 256 numbers available with which to represent a colour. For screen work, colours are best considered as containing a particular amount of the three component colours red, green and blue. Unfortunately, 256 does not split three ways, so Acorn have introduced a fourth component called *tint*.

To be just a little more technical, there are 8 bits available for specifying colour in a 256 colour mode (since 2^8=256). In the Archimedes 256 colour modes, 2 bits are allocated to red, 2 to green and 2 to blue. The remaining 2 bits are allocated to a tint. A tint is in practice a small amount of equal quantities of red, green and blue added to a colour. In fact, using this system 4 bits are allocated to each of the red, green and blue components. The bottom 2 bits of each being determined by the tint, and the top 2 by the red, green and blue components of the colour.

In Basic, colours in the 256 colour modes are specified as a GCOL component plus a TINT. The two parts are made up as follows:

GCOL number:

bits	0-1	red
	2-3	blue
	4-5	green

plus a TINT value:

bits 6-7

Put in decimal terms, GCOL (for foreground colours) can take any integer value from 0-63, while TINT is restricted to any one of the four values: 0, 64, 128, 192.

Thus if you write:

```
GCOL 3 TINT 0
```

you will get the following RGB allocation, expressed in binary notation:

red	1100
green	0000
blue	0000

In other words, the top 2 bits of red are turned on, and everything else is off. If you want to turn on the bottom two bits of red as well, to give a binary pattern of 1111 (the maximum red available), you can only do this by turning the tint full on. But since tint adds all three RGB components in equal quantities, you will unavoidably introduce small amounts of green and blue. Thus:

```
GCOL 3 TINT 192
```

will give the following allocation:

red	1111
green	0011
blue	0011

Without altering the colour palette - an ill advised option in the 256 colour modes - it is not possible to obtain 4 bits of red without green and blue components. And of course there are many other restrictions imposed by the 256 colour palette. For example, it is not as easy to get pure colour runs as it might be. If you need to have a particular colour in a range of shades, from light to dark, there is only one colour (white) which has a 16-colour sequence (since tints can be thought of as adding small quantities of pure whites or greys). Moreover, there is only a limited number of colours which have an eight shade sequence. The remainder have only 4-shade sequences, consisting of the four tints of the given colour.

To show the effect of this in practice, the program in listing 1 displays raised slabs in all those colours providing an 8-shade sequence (except black), with the RGB components of the base colour printed on the face. The eight component shades are made up as follows, though only three (as indicated) are used for drawing each slab:

r	g	b	tint 0	(shaded edge)
r	g	b	tint 64	
r	g	b	tint 128	
r	g	b	tint 192	
r+1	g+1	b+1	tint 0	(slab face)
r+1	g+1	b+1	tint 64	
r+1	g+1	b+1	tint 128	
r+1	g+1	b+1	tint 192	(bright edge)

where r, g and b are the base amounts of red, green and blue.

If you click on any colour, its RGB components (though not its tint) will be used to create a new background colour. This can be useful for showing how well various colours work together.

USING PAINT'S COLOUR NUMBERS

Another way to see the 256 colour palette in action is to use Paint. You can do this either by loading a 256 colour sprite into Paint, or by clicking Select over Paint's icon on the icon bar in any 256 colour mode, and telling it to create a new sprite. Half of your Desktop will immediately be covered with a massive 256 entry colour selection chart.

The colours in this appear to be laid out in no particular order, with short runs of different colours distributed apparently randomly over the chart. If you are using RISC OS 3, and click on the top leftmost colour (black) you will see the number 0 appear over the colour. Clicking on the next will display a 1, and so on, right up to brightest white at the bottom right-hand corner with a 255. The chart is laid out in colour number order, and colour numbers do not seem to bear any relation to colour at all. In fact Acorn has chosen to use the colour format recognised by VIDC, which is really very unhelpful. Colour numbers are made up as follows:

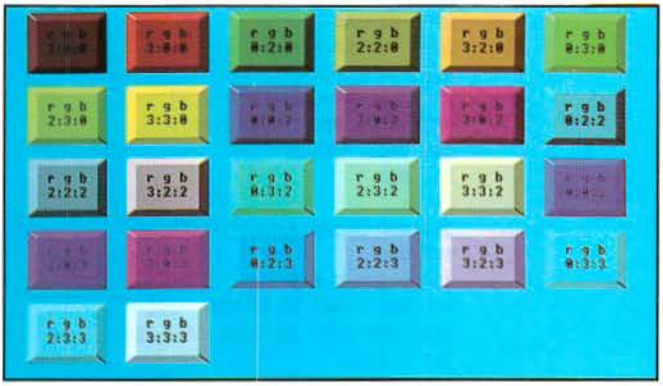
bit	use
0	tint (red+green+blue bit 0)
1	tint (red+green+blue bit 1)
2	red bit 2
3	blue bit 2
4	red bit 3
5	green bit 2
6	green bit 3
7	blue bit 3

No wonder the Paint colour chart looks as if it has been randomised!

What Acorn *should* have used is the standard ColourTrans GCOL number. This is similar in many ways to Basic's GCOL and TINT representation - except that it is even more logical. It works as follows:

bit	use
0	tint (red+green+blue bit 0)
1	tint (red+green+blue bit 1)
2	red bit 2
3	red bit 3
4	green bit 2
5	green bit 3
6	blue bit 2
7	blue bit 3

The program in listing 2 creates a more logical 256 colour selector. It is based on the GCOL representation rather than the colour number, and provides a display of Basic's GCOL and TINT numbers of the colour under the pointer at any time. The component RGB values (ignoring tint) are also displayed, as is the corresponding colour number used by Paint's colour selector. This means that you can use it to locate sequences of colours etc. for subsequent use in Paint. The palette display is organised so that all colours in each of the four vertical 4x16 blocks contain the same red value, and all colours in each of the four 16x4 horizontal blocks contain the same blue value (as indicated in the legend).



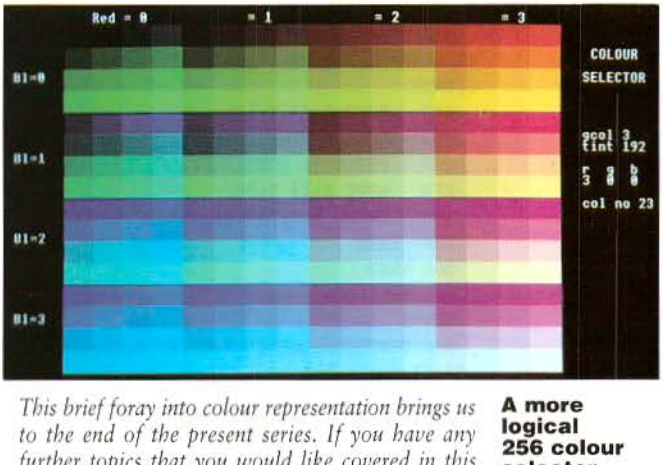
Slabs created using the 8-shade sequences in the 256 colour modes

Incidentally, Acorn provide a couple of SWI calls for translating between the gcol and colour number systems (see the new PRM 3-364):

```
SWI ColourTrans_ColourNumberToGCOL
```

and `SWI ColourTrans_GCOLToColourNumber`

The second of these is used in the program to generate the colour number display.



A more logical 256 colour selector

This brief foray into colour representation brings us to the end of the present series. If you have any further topics that you would like covered in this area, please drop us a line.

Listing 1

```
10 REM Program    Slab Colours
20 REM Version    A 0.51
30 REM Author     Lee Calcraft
40 REM RISC User October 1993
50 REM Copyright Lee Calcraft
```

```
  60 REM            Not Public Domain
  70 REM backup: adfs::0.$.
  80 :
  90 MODE 15
 100 *POINTER
 110 background=0
 120 REPEAT
 130  GCOL background +128
 140  CLG
 150  PROCdisplay_plinths
 160  REPEAT
 170   MOUSE X,Y,Z
 180  UNTIL Z>0
 190  REPEAT
 200   MOUSE A,B,C
 210  UNTIL C=0
 220  background=POINT(X,Y)
 230  VDU4:PRINT TAB(0,60);
 240 UNTIL FALSE
 250 END
 260 :
 270 DEF PROCdisplay_plinths
 280 VDU5
 290 r=0:g=0:b=0
 300 FOR Y=840 TO 0 STEP -200
 310  FOR X=50 TO 1100 STEP 200
 320   r+=1
 330   IF r>2 THEN
 340    r=0:g+=1
 350    IF g>2 THEN
 360     g=0:b+=1
 370     IF b>2 THEN ENDPROC
 380    ENDIF
 390   ENDIF
 400   r2=-(r+1)*(r>0)
 410   g2=-(g+1)*(g>0)
 420   b2=-(b+1)*(b>0)
 430   PROCplinth(X,Y,160,160,20,63,r2+
4*g2+16*b2+192,r2+4*g2+16*b2,r+4*g+16*b,
0,TRUE)
 440   MOVE X+40,Y+120
 450   GCOL 0 TINT 0
 460   PRINT "r g b"
 470   MOVE X+40,Y+80
 480   PRINT ;r2;":";g2;":";b2
 490  NEXT
 500 NEXT
 510 ENDPROC
 520 :
 530 DEFPROCplinth(X,Y,WX,WY,W,C0,C1,C2
,C3,C4,toplight)
 540 IF X=-1 THEN X=(1279-WX)>>1
 550 IF toplight=FALSE THEN SWAP C1,C3
 560 GCOL C1 MOD 64 TINT C1 AND 240
 570 RECTANGLE FILL X,Y,WX,WY
 580 GCOL C3 MOD 64 TINT C3 AND 240
 590 RECTANGLE FILL X+W,Y,WX-2*W,W
 600 RECTANGLE FILL X+WX-W,Y,W,WY-W
 610 MOVE X,Y:MOVE X+W,Y:PLOT85,X+W,Y+W
 620 MOVE X+WX-W,Y+WY-W:MOVE X+WX,Y+WY-
W
 630 PLOT85,X+WX,Y+WY
 640 PLOT85,X+WX,Y+WY
 650 IF NOT toplight SWAP C0,C4
 660 GCOL C0 MOD 64 TINT C0 AND 240
 670 LINE X,Y+WY,X+W,Y+WY-W
 680 GCOL C4 MOD 64 TINT C4 AND 240
 690 LINE X+WX,Y,X+WX-W,Y+W
 700 GCOL C2 MOD 64 TINT C2 AND 240
 710 RECTANGLE FILL X+W,Y+W,WX-2*W,WY-2
*W
 720 ENDPROC
```

Listing 2

```
  10 REM Program   Colour Selector
  20 REM Version   A 0.50
  30 REM Author    Lee Calcraft
  40 REM RISC User October 1993
  50 REM Program   Subject to Copyright
  60 REM           Not Public Domain
  70 REM backup: adfs::0.$.
  80 :
  90 ON ERROR PRINT REPORT$;" at line "
;ERL:END
 100 width=60:height=60
 110 MODE 15:OFF
 120 PRINT TAB(10)"Red = 0";SPC12;"= 1"
;SPC12;"= 2";SPC12;"= 3";
 130 FOR i=0 TO 3
 140  PRINT TAB(0,5+i*7)"Bl=";i
 150 NEXT
 160 FOR i=0 TO 15
 170  FOR j=0 TO 3
 180   FOR k=0 TO 3
 190    GCOL (4*i + j) TINT k<<6
 200    RECTANGLE FILL 100+width*(4*j+k
),930-i*height,width,height
 210   NEXT
 220  NEXT
 230 NEXT
 240 *POINTER
 250 x_tab=69
 260 PRINT TAB(x_tab,3)" COLOUR"
 270 PRINT TAB(x_tab,5)"SELECTOR"
 280 PRINT TAB(x_tab,13)"r  g  b"
 290 REPEAT
 300  MOUSE x,y,z
 310  gcol=POINT(x,y)
 320  tint=TINT(x,y)
 330  r=gcol AND 3
 340  g=(gcol>>2) AND 3
 350  b=(gcol>>4) AND 3
 360  gcol_n=(gcol<<2)+(tint>>6)
 370  SYS "ColourTrans_GCOLToColourNumb
er", gcol_n TO col_n
 380  PRINT TAB(x_tab,10)"gcol ";gcol;"
 ";
 390  PRINT TAB(x_tab,11)"tint ";tint;"
 ";
 400  PRINT TAB(x_tab,14);r;"  ";g;"  "
;b;
 410  PRINT TAB(x_tab,16)"col no ";col_
n;"  ";
 420 UNTIL FALSE
```

Just a Page

A page of short programs and procedures.

BASIC DEBUGGING PROCEDURES

Graham Crow

Here are two procedures which can be appended to any Basic program to assist with debugging. They are intended for use with Wimp programs, but can be used with non-Wimp programs by removing all references to VDU4 and 5.

They work by displaying the values of nominated variables on the Desktop background. This may be cleared of any unwanted printout at any time by just hitting F12, and pressing Return. The first procedure, *PROCdv*, displays a single variable in a chosen position. It takes four parameters: *x%* and *y%* are PRINT TAB positions, *s$* is the literal variable name (e.g. "*counter%*"), and *v$* is the value, as a string (e.g. *my_string$* or *STR$counter%*).

The second procedure, *PROCdl*, displays one or more variables of any kind. Its single parameter is a comma-separated list in quotes, for example:

`PROCdl("counter%,R$,FNstrip(s$),value")`

The formatted output starts at the top left of the screen, and automatically includes both the name and the value of each variable. To display a numeric variable as hex, precede it with ~. A local error routine is used to report any errors, and space is provided for up to 21 variables in the list.

Note that *PROCdl* uses a number of local variables (e.g. *sss%*). If you use any of these in your program, and try to debug it you will get incorrect results.

This month's disc contains a procedure for displaying array variables, in addition to the two procedures listed here.

```
 DEFPROCdv(x%,y%,s$,v$)
 VDU4:PRINT TAB(x%,y%)s$"="v$:VDU5
 ENDPROC
 :
 DEFPROCdl(list$)
 LOCAL ccc%,ttt%,mmm%,sss$,ccc$,var$()
 DIM var$(20)
 LOCAL ERROR
 ON ERROR LOCAL VDU4:PRINT TAB(0,ttt%+
2)"ERROR!":VDU5:ENDPROC
 FOR ttt%=1 TO LEN(list$)
  ccc$=MID$(list$,ttt%,1)
  IF ccc$<>"," sss$+=ccc$
  IF ccc$="," OR ttt%=LEN(list$) THEN
   IF LENsss$>mmm% mmm%=LENsss$
   var$(ccc%)=sss$:sss$="":ccc%+=1
  ENDIF
 NEXT:VDU4
 FOR ttt%=0 TO ccc%-1
  sss$=var$(ttt%)
  PRINT TAB(0,ttt%)STRING$(50," ")
  IF LEFT$(sss$,1)="~" THEN
   sss$=RIGHT$(sss$,LENsss$-1)
   ccc$=STRING$(mmm%-LENsss$," ")
   PRINT TAB(0,ttt%) sss$+ccc$+" = &";
EVAL(STR$~+EVALsss$)
  ELSE
   ccc$=STRING$(mmm%-LENsss$," ")
   PRINT TAB(0,ttt%) sss$+ccc$+" = ";
EVAL(sss$)
  ENDIF
 NEXT:VDU5
 ENDPROC
```

SOME SIMPLE VIRUS PROTECTION

Lee Calcraft

With a few lines of code it is possible to turn off your hard disc(s) so that they cannot be easily invaded when a suspect floppy is being checked. The idea is to turn off the filing system used by your hard drive(s). This of course is not much use if your hard drive uses the ADFS filing system, because you could not then use the floppy (though you could back it up to RAM disc, and then disable the adfs).

To use this technique, just type in the following two lines of Basic, and save the file away - perhaps keeping it on the Pinboard. When you double-click on this file it will set up function key F1 to disable the IDEFS, and function key F2 to re-enable it. Change *IDEFS* for *SCSIFS* or whatever, to suit.

```
*KEY 1 *RMkill IDEFS|M SOUND 1 &16F 200
2|M
*KEY 2 *RMreinit IDEFS|M SOUND 1 &16F 7
0 2|M
```

The bar character before the *M* is on the key above Return. When using the function keys you will need to be at the command prompt (use F12 or Ctrl-F12 from the Desktop).

Please drop us a line if you have suitable programs or procedures for this column. Any program that will fit on a page could qualify. All contributions will be paid for.

The range of TurboDrivers has expanded to include versions for the Hewlett-Packard DeskJet and LaserJet range of printers, as well as the Canon bubblejet range. The latest release 3 versions are now fully RISC OS 3.1 compliant, offer new advanced features and are faster than ever before.

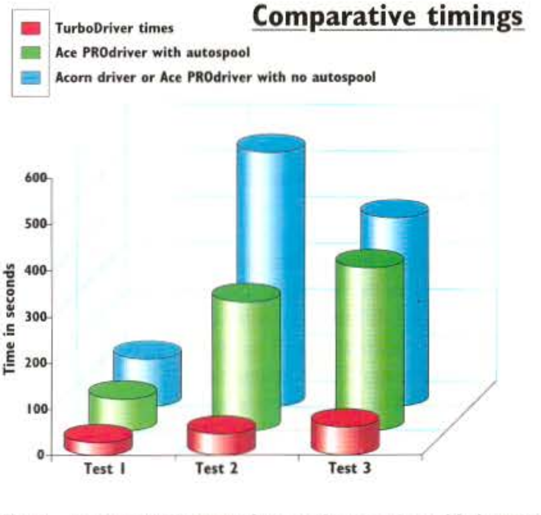
The bottom line is that if you value your time, the TurboDrivers are for you - they can render pages and give control back typically at between three and ten times faster than Acorn printer drivers or Ace PRODrivers. Indeed once the image has been rendered then the printing continues entirely in the background - as fast as the printer will go. This makes a large difference for just one page and an enormous difference if you are printing more than one copy of each page.

FEATURES

- **Full 24-bit colour support for Canon BJC-800 and HP DeskJet colour printers.**
- **Three or four colour separations - even for mono printers.**
- **Extensive halftone screen control - different screen types, angles, screen density; features you would normally only find on expensive PostScript printers.**
- **Print from file entirely in the background.**
- **Fully RISC OS 3 compatible - works with !Printers and supports rotated text and sprite printing, multiple printers etc.**
- **By far the fastest printer drivers available for Acorn 32-bit computers - see chart.**

RISC OS 3 Turbo DRIVERS

Comparative timings



Test1 - A single DTP page of text and scanned graphic images
Test2 - Two copies of a three page text and graphic document
Test3 - A complex full page of graphics from ArtWorks.

The timings indicate the time in seconds to get control back. All tests performed on HP DeskJet 500 printer using a 4Mbyte A440 with an ARM3 fitted. Other machine combinations show similar performance gains.

Illustrated are a selection of printers supported by TurboDrivers. There is constant development in driver support so please contact Computer Concepts for details of latest printers.

Canon TurboDrivers £49 + VAT (£57.57 incl.)
(supports all BJ-10, BJ-200, BJ-230, BJ-300 and BJC-800 printers)

HP TurboDrivers £49 + VAT (£57.57 incl.)
(Supports all monochrome and colour DeskJet and LaserJet printers)

*Please specify printer type when ordering. The BJ-230 and all HP TurboDrivers are only suitable for RISC OS 3.1 machines.
2 MBytes required.*

Computer Concepts Ltd

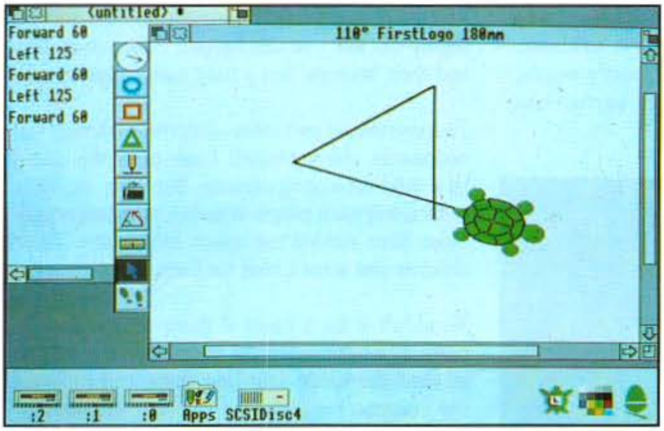
Gaddesden Place, Hemel Hempstead, Herts HP2 6EX Telephone 0442 63933 Fax 0442 231632

FirstLogo

Mark Sealey looks at the latest Logo offering from Longman Logotron.

FIRST, SOME DEFINITIONS

Logo's origins lie in research into Artificial Intelligence in the late 1960s. It was developed from LISP, specifically as an aid to teaching logical thought. Influenced by the swiss educationalist Jean Piaget, Logo's 'author' Seymour Papert believed that this could best be achieved by providing an immediate, concrete and visual environment in which children could explore mathematical ideas in a structured yet open-ended way.



```
Forward 60
Left 125
Forward 60
Left 125
Forward 60
```

Figure 1. Trying to draw a triangle

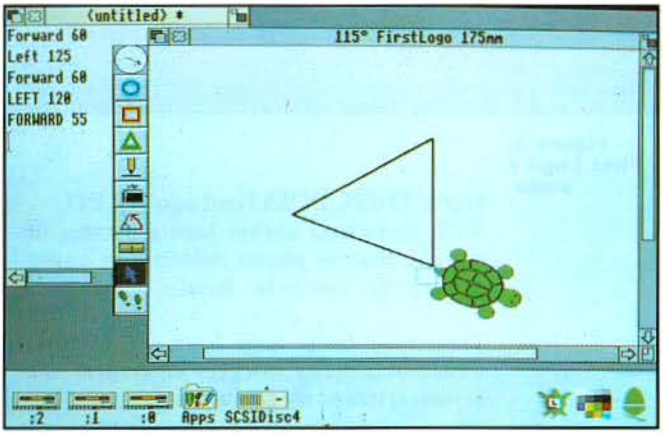
This is the famous turtle graphics: a cursor is driven around the screen by means of simple "body-centred" (i.e. vectored) geometrical commands such as ForwarD 80 pixels (FD 80) and LeftTurn 90 degrees (LT 90), optionally leaving a trail of where it has been and thereby constructing simple line drawings. Once you are happy with the list of commands to achieve a given effect, it is entered into a Procedure (as happens with BBC Basic or Pascal) and given a name to form a new building-block command (or Primitive). This is then available (Forth like) either until the session is ended or, if a file containing this new definition is saved, permanently.

It is to this graphical side of the language that several publishers have restricted themselves - to the exclusion of the language's list processing capabilities - in products like Sherston's *Crystal Rain Forest* and Topologika's *Screenturtle* and indeed the subject of this review, Longman Logotron's *FirstLogo*.

SECOND, A LITTLE HISTORY

Cambridge-based Logotron (as they were then) were one of the first publishers to supply a Logo in ROM for the original BBC Micro in 1985.

An Archimedes version appeared - courtesy of the now much expanded Longman Logotron - in 1988; this version neither ran in the Desktop nor was ever updated to exploit the features of RISC OS, when the new operating system was released. Graphics created using FirstLogo, for instance, can be dropped into word processing or art applications and used to illustrate other work.



```
Forward 60
Left 125
Forward 60
LEFT 120
FORWARD 55
```

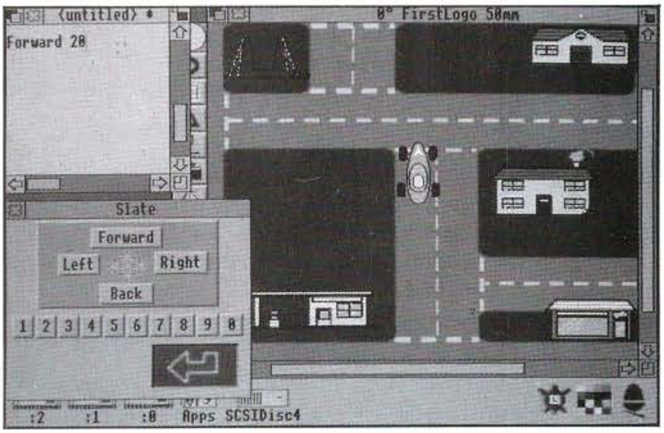
Figure 2. A perfect triange

Two years later the Mathematics Orders of the National Curriculum enshrined work with Logo as mandatory, albeit in a not very original way. This has virtually ensured that all Primary teachers (and their more imaginative Secondary colleagues) must expose pupils to the features of what has become rather a misunderstood application.

SO, WHAT CAN LOGO DO?

Papert's aim was to encourage children not to "do maths" but "be mathematicians", to become so involved in problem-solving and mathematical investigation that they extend for themselves the very processes of learning. They do this by watching themselves learn, by reflecting on how a certain result has been arrived at in order to achieve a similar one.

Comments from a group of children thoroughly immersed in some Logo activity like "we didn't do it that way last time!" or "why don't we times it by two... it's twice as far?" are common. Such children are discovering and refining new ways to think. They are using Logo, again in Papert's words, as "a tool to think with". Logo carries out their hypotheses.



```
Forward 20
```

Figure 3. First Logo's 'slate'

HOW THEN, DOES FirstLogo FIT IN?

Well, there have always been a number of obstacles likely to prevent children from getting to where they want to be - literally.

These arise in the main from the way that numbers (usually integers entered at the keyboard) control the geometry.

Until now it has been all too easy to press Return before entering the "0" of what you had intended to be "RT 90". The turtle, computers being obedient creatures, does what it is told and produces a jagged right turn of 9 degrees! Backtracking and finding the bug can be beyond many novice Logo users and frustrating to most.

Logo expects a space between the command (e.g. "FD") and its parameter (e.g. "60"). To get the command to all intents and purposes 'right' but foul up on the syntax is to get no command that Logo recognises at all and generates frustration for the new or excited user. The real strength of this latest version of the language, though, is that a way round this has been found. It puts in the spaces!

Another example: children have been trying to draw a triangle as part of a roof for that simplest of Logo standbys, the house. They have worked out that some pretty large angles are required. LT 125 has been tried and worked well for the first turn and so they thought for the second (figure 1). But - as can happen - they overshoot and their 'triangle' has a truly sickly appearance.

To experienced and more competent (though not necessarily older, please!) Logo users this could be a valid debugging exercise. But there are likely to be fewer such people if earlier encounters with Logo have yielded too much frustration. These children just want a roof for their house!

Wouldn't it be a boon if there were a way to point at where you want to go with the mouse, to send the turtle scuttling there and to make the computer supply the relevant commands. Well, with FirstLogo just hold Select down on the turtle's tail, a blue box appears; drag this carefully to the joining point in the triangle and the result (figure 2) is the turtle sitting in the right place, the necessary commands to get there in the Notepad window (top left) and - most important - the Logo users happy.

They can get on with the more important, more interesting and more educationally productive tasks of exploring mathematical ideas through the logic and structure of Logo. Their building tasks are not confounded by faulty bricks.

WHAT OTHER FACILITIES DOES FirstLogo OFFER?

FirstLogo operates totally within the Desktop. There are three separate windows: one for the graphic as it is constructed with perhaps a rather large cursor that can take any one of nine shapes. Attached, on its left, is a ten-tool toolbox; this contains icons to indicate the turtle's bearing/heading, draw circles, squares and triangles, to operate the pen up/down command, change colours and step through procedures.

Just as you can have the turtle placed where you want it, two of the icons in the toolbox will measure angles and distances - also in order to aid completion of a task quickly and without fuss.

Then there is a window that contains the Logo commands as text. These can be edited and saved as a text file. But there are several touches to make things simpler still for the user: deleting commands in the notepad undoes the corresponding turtle moves. Text entered in the notepad can be turned into a Logo procedure merely by highlighting it and naming it from a standard menu. This procedure can then easily be stepped through line by line. All very useful!

There is a third window (see figure 3). This is the 'slate', and it can be displayed at two sizes (or not at all). By its use the keyboard can be dispensed with altogether and directional commands entered by pointing and clicking with a large left-facing arrow representing Return.

So, Logo has invaded the Desktop in almost all ways possible in Longman Logotron's FirstLogo: graphics can be saved as Draw files, operations such as printing, saving and loading can be effected by the usual Wimp sequences. The function keys have not been forgotten. Each of these is dedicated to a common Logo command such as stamping (leaving the imprint of a sprite behind as the turtle travels), though they can be changed very intuitively to suit your needs.

Sprites can be used directly. They can be dropped in the FirstLogo graphic window, and used both as backdrops to the work in hand or as a part of it. This is the case of the village map in figure 3, where the cursor car is about to emerge from the junction without indicating!

DOCUMENTATION AND CUSTOMISATION

The A4 manual which comes with FirstLogo is strong on suggesting activities that might profitably be undertaken with the six 'scenes' supplied with the package; so much so that you should not be left wondering what you can do with any other spare sprites that you have to hand. Imagine the fun of navigating around a scanned photo of the school's playground, or defacing a sprite derived from this year's class photograph. In other respects the manual is clear, although it could not be used by most children unaided.

FirstLogo is very attractively priced and boasts several other useful features. For example, you can change certain key parameters controlling the way the application behaves to suit yourself. This even extends to having it operate in either Welsh or French as well as English. This caters for other UK users following the National Curriculum both as native speakers and learning the most popular second language taught in schools.

CONCLUSIONS

There are omissions: variables are not implemented; hence neither are parameters to procedures. In partial compensation, Repeat is, and there is greater control than in 'traditional' Logo implementations over such aspects of appearance as line width and style and the easy filling and "completing" of shapes.

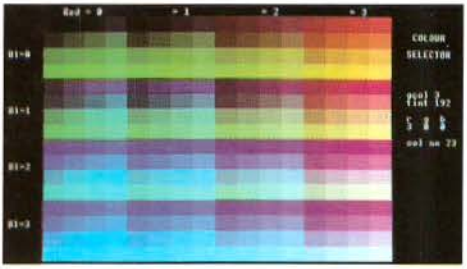
If this had been called WimpLogo, it would have deserved approbation because such a product was long overdue. FirstLogo is this and more: it is an excellent starting point because it makes using Logo easier.

PRODUCT INFO	
Product	*FirstLogo*
Supplier	*Longman Logotron,* *124 Cambridge Science* *Park, Milton Road,* *Cambridge CB4 4ZS.* *Tel. 0223 425558* *Fax 0223 425349*
Price	*£28.20 inc. VAT + p&p* *(Single user) £84.60 inc. VAT* *+ p&p (Primary site licence)*

Don't expect this Logo to support anything like the number of primitives that the full Logo does. It's not intended to. But it is an excellent base from which to build. What it is meant to do - provide a secure and serviceable multi-tasking introduction to turtle geometry - it does admirably, and should quickly find its way into most schools' software libraries.

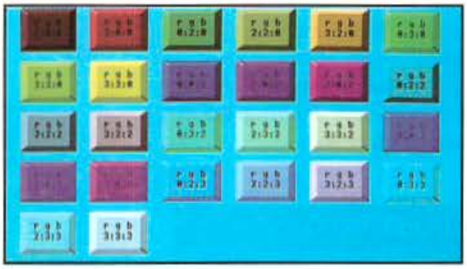
RISC User Disc October 1993

Colour Selector



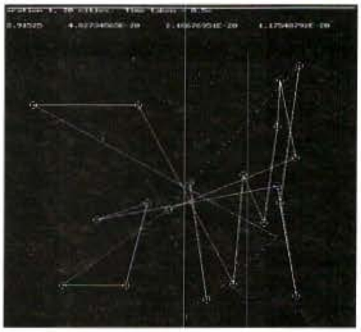
This little application is part of the *Working with Images* feature in the magazine, and provides a more logical 256 colour selector than that provided by *Paint*. It displays the GCOL and TINT numbers of the colour under the pointer, the corresponding colour number used by *Paint*, and the component RGB values.

Slabbed Colours



This application, also from the *Working with Images* feature, provides a very useful method for selecting colours that work together. It creates raised slabs of all the colours that provide an 8-shade sequence, with the background colour selected by clicking on the various sides of the slabs.

The Travelling Salesman



This program is an implementation of the famous Travelling Salesman problem. It tries to work out the shortest possible route that a salesman has to travel to visit several cities in different places. To do this, it uses an artificial intelligence routine called a Genetic Algorithm. More information on this program can be found in the article *Natures Way: Exploring Genetic Algorithms* in the magazine.

Wimp Topics

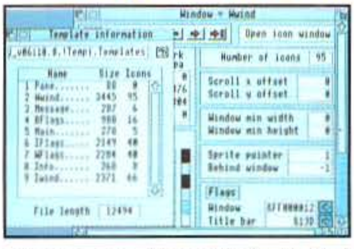
The magazine disc contains the solid sprite dragging and menu creation procedures discussed in the *Wimp Topics* feature in the magazine.

Just A Page

Programs from this month's *Just A Page* feature allow you to turn your hard drive on and off to stop viruses infecting it when you examine new discs, and a set of Basic procedures for debugging Wimp applications. There is also an extra debugging procedure not listed in the magazine.

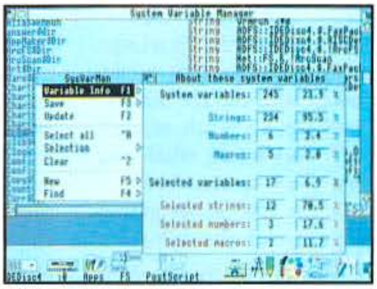
ADDITIONAL ITEMS DESCRIBED IN THE MAGAZINE

Template Information Utility

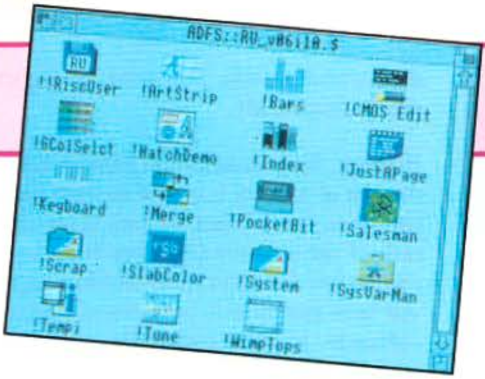


Tempi will prove to be an excellent addition to your application development directory. Run beside your template editor, it provides extensive information on your template files, with details such as how many icons each window contains, what their validation strings are, and which window flags are set.

System Variable Manager

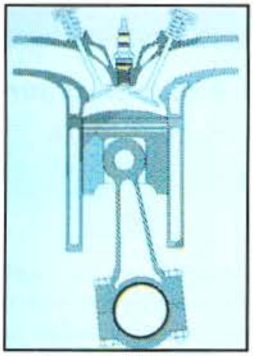


This powerful application provides you with complete control over the system variables, which are used to store details such as the *Copy* options, application directory details, and what icon is used to



represent a file. It will allow you to modify file run actions, change your font path, and even save individual system variables, so you can reset them if the wrong applications are loaded when you double-click on your files.

This action-packed magazine disc costs just £4.75 inc VAT.



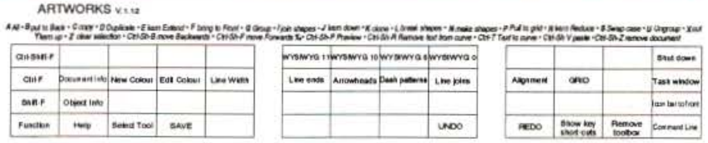
HatchBack Draw File

The magazine disc contains a demonstration Draw file processed with 4Mation's newest family member, *HatchBack*. For more information on this application, see the item in the *News* pages.

BONUS ITEMS

ArtWorks Keystrip

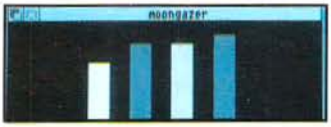
A function keystrip for Computer Concepts' ArtWorks. As well the function key definitions, the keystrip also shows the various hotkeys provided by ArtWorks. The keystrip is a Draw file, and is a must for all ArtWorks users.



ARTWORKS V.1.12

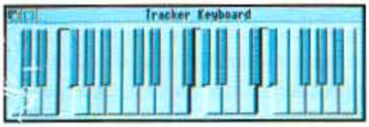
Ctrl-Shift-F					WYSIWYG 11	WYSIWYG 10	WYSIWYG 5	WYSIWYG 0				Shut down
Ctrl-F	Document info	New Colour	Edit Colour	Line Width	Line ends	Arrowheads	Dash patterns	Line joins	Alignment	GRID		Task window
Shift-F	Object Info											Icon bar to front
Function	Help	Select Tool	SAVE					UNDO	REDO	Show key short-cuts	Remove toolbar	Command Line

Tracker Bars



Tracker Bars is a fun application that provides an attractive graphical display while a SoundTracker tune is playing. It supports both 4 and 8 track songs, with the pitch of each track represented by the height of the bar, and the volume by its colour. It also provides information on the tune, and start/stop controls.

Tracker Keyboard

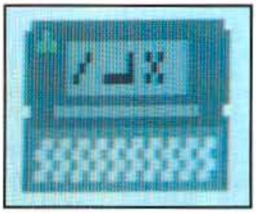


Tracker Keyboard is an accompaniment to *Tracker Bars*. It will "play" any SoundTracker tune on a well designed piano keyboard, which has 3D keys that depress as the tune is played. You can run any number of copies of the program at the same time, with each keyboard playing a different track.

Soundtracker Tune

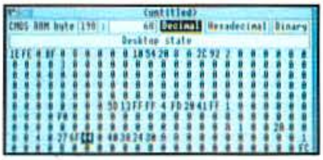
The magazine disc contains the public domain SoundTracker tune *MoonGazer* for use with the *Bars* and *Keyboard* applications.

Pocket Book Bitmap Editor



This application is for the Acorn Pocket Book. It allows you to produce bitmap graphics for use in your own OPL programs. As the editor is supplied on an Archimedes disc, you will need to use A-Link to copy it to your Pocket Book.

CMOS RAM Manager



This application allows you to load, save and edit your computer's CMOS RAM settings from the Desktop. It was originally supplied on the RISC User Magazine Disc 3:6, and has now been updated according to the RISC OS 3 Programmer's Reference Manual. It will still run correctly under RISC OS 2, displaying the original text. On RISC OS 3, it will use the new CMOS information, and also supports the DragASprite module.

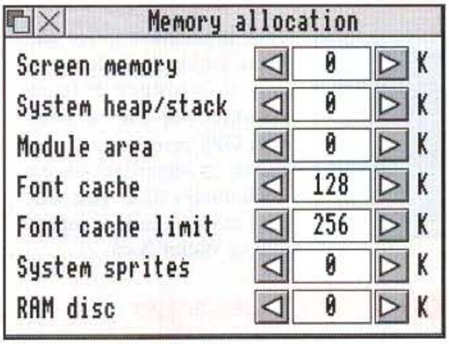
ArcScan Data

ArcScan Index files for RISC User 6:9 and 6:10, and an application for updating your existing Volume 6 Index. Plus the ArcScan Index file for BEEBUG Vol.12 No.5. Read the Help file before attempting to update your RISC User ArcScan file.

All about Fonts
(Part 2)

Kell Gatherer discusses configuring your system to get the best from your fonts.

The Acorn Font Manager is a sophisticated piece of software that deals with the screen display and printing of outline fonts. Last month we had a look at how outline fonts are constructed, and the methods used to improve screen definition and printing. In this article, we will look at the various configure settings that can be used to get the best from your system. Some of these have been covered in *Understanding Configure* (RISC User 6:4), but here we'll examine in more detail what the Font Manager can actually do.



Memory allocation

Screen memory	0	K
System heap/stack	0	K
Module area	0	K
Font cache	128	K
Font cache limit	256	K
System sprites	0	K
RAM disc	0	K

Figure 1. Setting FontSize and FontMax (RISC OS 3)

As we saw in the last article, outline fonts are stored as device-independent files. These are converted to bit-maps by the Font Manager, and can then be used for printing or screen display. The various configure settings affect how the fonts are displayed on screen, and cater for almost all systems, from those with 1Mb memory and no hard drive to professional DTP systems with 20" high resolution monitors and 16Mb of RAM.

Computing a bit-map from an outline takes time, particularly when anti-aliasing and hinting is also involved. If the Font Manager performed it on a character-by-character basis, there would be an unacceptable delay in updating the screen. The solution lies in creating bit-map images, similar in many ways to sprites, of 32 characters at a time, and storing them in an area of memory known as the font cache. When a character needs to be displayed on screen, its bit-map is found in the font cache and placed on screen in the required position. This speeds up the screen display dramatically.

However, this process is very memory intensive. An area of memory is needed for each block of characters, for each font currently in use, and for each of the different font sizes being used. A complicated document could therefore require a very large font cache to be displayed quickly and correctly. If there was unlimited memory available, the Font Manager could cope with any eventuality, but as we users know, memory comes at a price. The Font Manager therefore expects you to limit the amount of memory it uses. This involves a trade-off between the number of fonts that can be cached at any time, and how well they are displayed on screen. The Font Manager is controlled with the configure settings, and these can be set, either from the command line, or with the *Configure* application in RISC OS 3 (see figure 1).

FontSize

The most important configure setting is the *FontSize*. This is the default size of the font cache, and specifies how much memory you want permanently allocated for fonts. It can be set at the command line with the command:

```
*Configure FontSize nnK
```

where *nn* is a value between 0 and 1024. The default value for *FontSize* is 32K, and it is not sensible to set it to anything less than this. If you never use outline fonts, you could set it to zero, freeing up the maximum amount of memory for other applications. However, this can have its disadvantages; if an outline font is subsequently requested, the system will have to continually reload the fonts from file, which considerably slows response. (Try setting it to 0 on RISC OS 3 and rebooting your system to see this effect.) Conversely, if you set the font cache too large, you will be using up memory that could be used by other applications. On a 1Mb computer, a 32K FontSize is recommended, and if ever you find the screen display unacceptably slow (i.e. when using a DTP application), the font cache may be manually tweaked using the Task Manager. On a system with more memory, the FontSize may be set to 128K or higher, to a maximum of 1Mb.

FontMax

When the font cache is too small, each screen refresh can result in a lot of disc (and hourglass) activity. The Font Manager will then try to grab more memory for the cache, which leads us to the second important configure setting:

```
*Configure FontMax nnK
```

When *FontMax* is set to 0, the Font Manager will not even attempt to increase the size of the font cache beyond its configured FontSize. Configuring FontMax to the same as, or higher than FontSize is in effect authorising the Font Manager to grab more memory as required. The Font Manager tries to keep to FontMax by discarding as much cached information as possible. It does this by keeping track of which bit-maps have not been used for a while. However, if there is more memory available, and the Font Manager considers it unreasonable to try to keep to FontMax, it will grab even more memory. If you are using your computer for DTP, and have 2Mb or more of memory available, it therefore makes good sense to set FontMax to a much higher figure, let's say 360K. The Font Manager in any case will try to shrink back to FontSize as soon as it can, as and when fonts are *discarded*.

The above two settings are the important ones, and may be set using the *Memory* section of the *Configure* Application (RISC OS 3), or directly at the command line. The next options are set at a pixel value in RISC OS 2, or a point size in RISC OS 3 (see figure 2).

FontMax1

The setting of *FontMax1* is to do with mixed use of outline fonts and bit-map fonts, and is rarely used. Most users will have this set at 0 (off).

FontMax2

The setting of *FontMax2* is far more important. It dictates the usage of anti-aliasing. The computed bit-maps created in the font cache may be 4 bits per pixel (anti-aliased) or 1 bit per pixel (not anti-aliased). The default for *FontMax2* is 24 point - this means that any type sizes above 24pt, for example headlines, will be displayed without anti-aliasing, thereby saving memory and speeding up the display. If you set FontMax2 to 0, anti-aliasing will not be used at all.

FontMax3

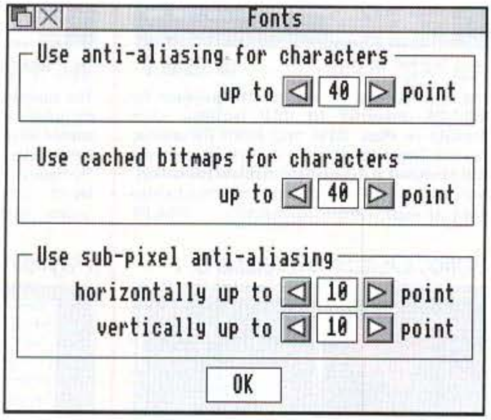
FontMax3 determines whether the cached bit-map is retained after use: if a character is to be drawn larger than this setting, it is drawn directly on screen from the outline with no cacheing at all. This is so that document headings etc., where a few larger characters appear, do not flush everything else out of the font cache. This could be set to the same as *FontMax2*, e.g. 24pt.

FontMax4 & FontMax5

The remaining two configurations will normally be set at 0 (off), since they are to do with sub-pixel anti-aliasing (phew!). Setting them to a higher value really requires an ARM 3 with a large amount of fast memory, since these settings control a refinement of anti-aliasing in which four separate versions of each character are kept in the font cache. These different versions correspond to four possible subpixel alignments on the screen: the Font Manager chooses the version that best matches the pixel grid. Setting this can greatly improve the quality of characters at small sizes. You can see this by typing a row of the same character at 12pt while FontMax4 is set at 0: you'll notice bunching of characters due to inaccurate matching with the grid (see figure 3). Now type

```
*Configure FontMax4 24
```

at the command line and press Return: this time the characters are evenly spaced. On the minus side, setting both these options actually results in the font cache holding 16 different versions of each character! For this you need a lot of memory and fast computing power, and most users with the current generation of ARM machines will have both these options switched off.



Fonts

Use anti-aliasing for characters up to 40 point

Use cached bitmaps for characters up to 40 point

Use sub-pixel anti-aliasing
horizontally up to 10 point
vertically up to 10 point

Figure 2.
Setting FontMax 2,3,4 and 5 (RISC OS 3)

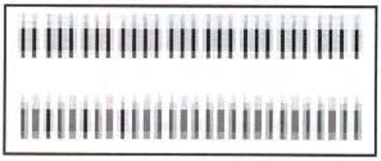


Figure 3.
Gross enlargement of the screen showing bunching of the character 'i' when FontMax4 is set to zero. In the lower example (FontMax4 set to 24), four different anti-aliased versions have been used to spread the characters evenly across the pixel grid.

Next month, in the concluding part of this series, Kell Gatherer will be making some general observations about font design.

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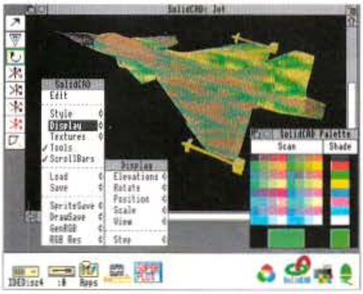

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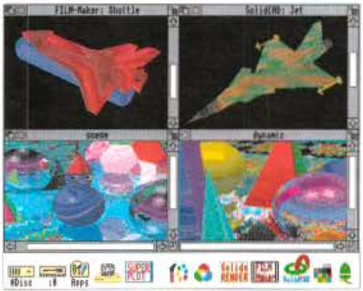

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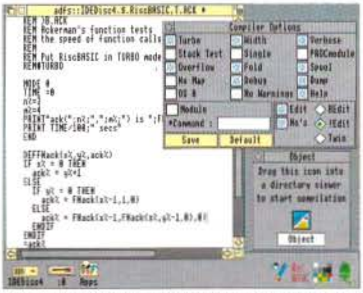

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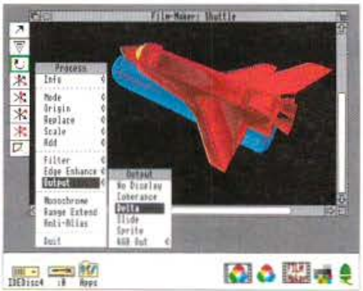

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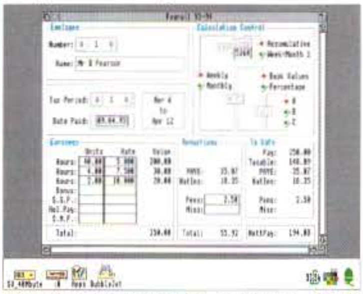

The complete RISC OS Compliant Payroll Manager handling the latest budget changes. Features include Weekly/Monthly salaries, cumulative or week1/month1 Tax basis, Book or Percentage values and selection of Tables A to E. Reports include Wage slips, Deductions Working Sheets, Cash Breakdown and Total Employer Expenses, plus End of Year P14/P60. *"Comprehensive and User friendly"* ***£99.95***

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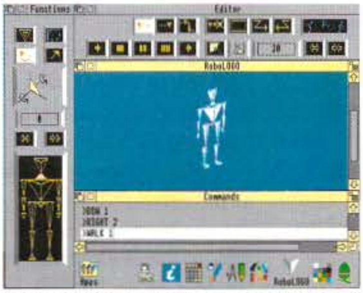

RoboLOGO provides the ideal introduction to computing allowing 2D and 3D control of an articulated humanoid or animal figure based on the standard LOGO language. The traditional Turtlegraphics and 3D Glider are also supported to utilise existing course work. *"Takes Turtlegraphics and LOGO into a new dimension" - Educational Computing.* ***£49.95***

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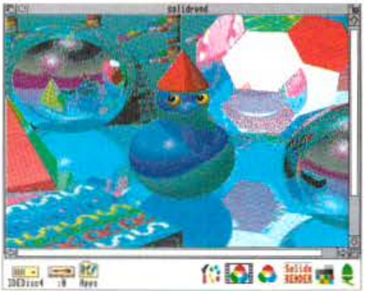

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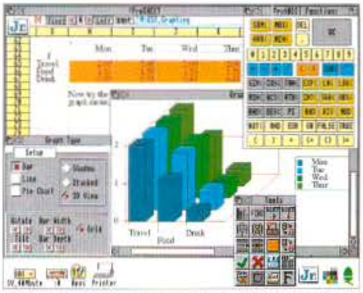
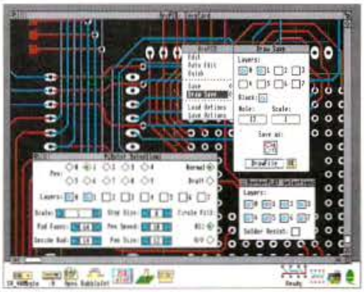


The complete spreadsheet developed for education, home user and business providing most of the facilities of the heavyweights at a fraction of the price with an emphasis on ease of use by means of icon driven toolbox menus. Features include a full range of spreadsheet functions, macros and hot-linked graphing for bar, line and pie charts with 3D effects. *"Affordable Spreadsheet Technology"* ***£49.95***

ARC-PCB™ Schematics v5.1



The range starts at ARC-PCB v1.8 for purely Digital PCB layout, graduating to ARC-PCB Professional v3.2 for combined Analogue/Digital PCB layout and ultimately to ARC-PCB Schematics v5.1 providing both Circuit Schematic drawing and all PCB layout features. All versions include Auto-Routing, Multiple layers, Component pulling, Printer & Plotter support, & capacity up to 300,000 components. GerberPLOT & ExcellonDRILL options are £75 each. A 100% Rip-Up Retry PowerROUTER option is £195. The Alpha-Tracks Teaching Course option is £90 for a Site License. *"Performs up to professional standards." - BBC Acorn User.* ***£125*** *(v1.8)*, ***£275*** *(v3.2)*, ***£375*** *(v5.1)*

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Instant SCSI and CDFS

Lee Calcraft reviews Atomwide's cunning Parallel SCSI Adaptor

Atomwide's recently released Parallel SCSI Adaptor really is a cunning device. If your computer has a bi-directional parallel port (A3010, A3020, A4000, A5000 or A4) then you can simply plug in the SCSI Adaptor, and benefit from all the good things which come in SCSI format, including CD-ROM and hard drives.

JUST PLUG-AND-GO

The kit consists of 8 sides of documentation (more than adequate), a floppy disc and a SCSI cable to which is already attached an in-line adaptor some 2 inches in length.

To get the thing up and running you simply plug the lead into the parallel port on your computer and plug the other end (a standard Centronics type SCSI connector) into your SCSI device. A SCSI terminator plug (not supplied) should be fitted to the other SCSI socket on the device, or to the end of the chain if you are daisy-chaining a number of SCSI devices. Finally double-click on the application *!BootSCSI* supplied on disc, and the job is done.

The software automatically loads standard Acorn SCSI and CDFS modules, as well as the proprietary *Parallel SCSI* module. It then checks the number of SCSI devices that you have attached, and places the appropriate number of drive icons on your icon bar, each having exactly the same functionality as normal Acorn SCSI and CDFS drive icons.

The whole process of installation is thus trivially easy. But there are one or two provisos. Firstly the Adaptor will not work if you have a dongle attached to your parallel port, such as those supplied with ArtWorks or Impression. These do not permit two-way data transfer, and must be removed before plugging in the Adaptor. Secondly the Adaptor is powered not from the computer, but from the SCSI device itself, and an LED on the casing of the Adaptor indicates whether power is present or not. With my Cumana CD-ROM drive there was no problem, but when I tested the Adaptor with Acorn's Multimedia Expansion Unit, the power light did not come on, indicating that the 'terminator power' link needed to be set on the drive unit.

Another point to bear in mind is that if you are intending to use the SCSI Adaptor to provide a hard drive for a computer without one, you will need to boot up from floppy each time, because your computer will not be able to read the hard drive until it has first run *!BootSCSI*. Also, if you want to keep your printer connected at the same time, you will need the slightly more expensive Printer/Parallel SCSI Adaptor.

TIMINGS

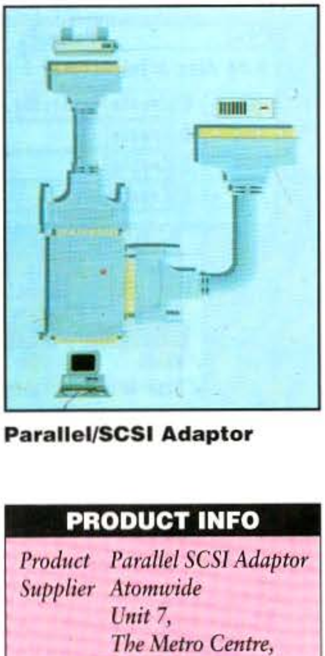
I tested the SCSI Adaptor with a Cumana CD-ROM unit (the drive was a Sony CDU 541), and it performed impeccably. Timings for loading files and opening directories were the same as those obtained using Acorn's SCSI card on an A540 - an excellent result.

The SCSI Adaptor is claimed to have a throughput of some 200Kb/s, which was borne out in practice. The CDU 541 has a data transfer rate of 150Kb/s, and clearly the SCSI Adaptor created no bottlenecks in throughput. With faster drives, such as a double-speed CD-ROM drive, or a hard drive, some degradation in performance would be expected over a standard SCSI interface.

Running CD-ROM based Replay movie sequences on an A4 also worked faultlessly on the shorter sequences (those suffixed with a '2' on VideoClip Collection One). The longer sequences got completely out of step - a phenomenon not encountered using Acorn's SCSI card with the same CD drive.

CONCLUSION

This is an excellent package. It is trivially easy to set up, and performed faultlessly under tests. It provides a very simple way to add a CD-ROM drive, and will be a particular boon for A4 users.



Parallel/SCSI Adaptor

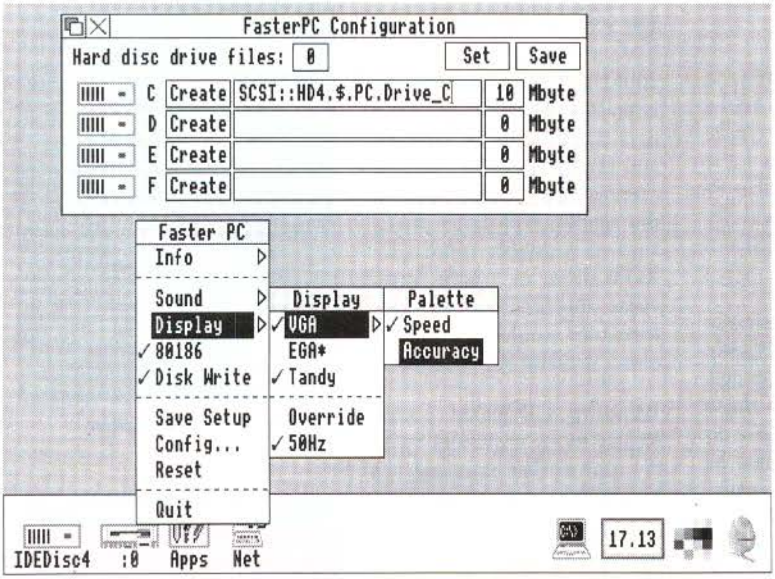
PRODUCT INFO

Product	*Parallel SCSI Adaptor*
Supplier	*Atomwide* *Unit 7,* *The Metro Centre,* *Bridge Road,* *Orpington,* *Kent BR5 2BE.* *Tel. 0689 838852* *Fax 0689 896088*
Price	*Parallel SCSI Adaptor* *£49 ex VAT* *Printer/SCSI Adaptor* *£75 ex VAT*

FasterPC - A Faster PC Emulator

Gordon Gilmore looks at an alternative to Acorn's PC Emulator.

The Acorn PC Emulator PCEm has around almost as long as the Archimedes itself. It has been through various updates to the present version 1.82. At one time the emulator could reasonably be compared in speed to the official IBM PC itself. Inevitably, the development of faster 32 bit processors has left *PCEm* far behind where speed is concerned.



FasterPC Configuration

Hard disc drive files: 0

C	Create	SCSI::HD4.$.PC.Drive_C	10	Mbyte
D	Create		0	Mbyte
E	Create		0	Mbyte
F	Create		0	Mbyte

PCFaster's Menu and Config window

FasterPC, written by David Lawrence, is a new entry into the PC emulation scene, and is claimed to provide faster graphics handling and better sound implementation.

The program is presented on a single floppy together with a DOS format support disc carrying a couple of utilities and various demonstration files. These are accompanied by a very chatty and informative manual which goes into some detail about the rationale behind the design of the emulator. I am not sure that knowing that the author wrote the first draft under a palm umbrella in Tunisia contributes much to an understanding of the program but it does at least let us know that he is human, if a little hedonistic.

The current official version of *FasterPC* is 1.00 but during the review a beta test version 2.00 winged its way onto my desk. This has one or two additional features which, to my mind, are essential, and the review is based upon this later version run on an elderly Archimedes 310 with 4 Mb of RAM with its original ARM processor and a standard monitor.

INSTALLATION

The program can be copied to hard disc or floppy and run from either. Double-clicking on its icon in the Filer window installs it on the icon bar. If you click on the icon bar immediately *FasterPC* will run, but since it doesn't yet know about your hard disk will only recognise your floppy. Clicking the menu button over the icon provides a standard menu with a 'Config...' option. Selecting this displays the hard disk configuration window shown in the screenshot. Drag your PC hard disk file icon into the appropriate slot in the configuration window, click on 'Save' and that's it. There are no facilities for defining a start-up command as in PCEm and no need to specify expanded memory size since *FasterPC* doesn't handle it.

Once configured, clicking on the *FasterPC* icon will run the emulator and boot up DOS from the hard disk. *FasterPC* doesn't attempt to multi-task, so the emulator immediately claims the whole of the screen. The RISC OS Desktop can be returned to at any time by holding down Alt and pressing the Menu button. As long as the return to the desktop was not caused by an error you can return to *FasterPC* exactly where you left off by clicking with Adjust over the icon bar icon. This is not available in version 1.00 where every return to the emulator re-boots DOS. Errors, including the familiar 'Illegal or unsupported opcode detected', resulted in a dignified return to the desktop without removing *FasterPC* from the icon bar. This means that you can re-boot immediately and try again. There is a useful 'Reset' option on the icon bar menu which releases the hard disk so that you can access from RISC OS. Can we have this is in *PCEm* please!

The memory utilisation of 1184K for *FasterPC* is smaller than that for *PCEm* (1376 Kb minimum) but the free DOS memory available is about the same for both.

The utilities provided on the support disc are *FPCMOUSE.COM* to use in place of the Acorn mouse driver and *FPCQUIT.COM* which allows an automatic return to the Desktop from within a DOS batch file.

HOW FAST IS IT?

The actual speed improvement for any particular program depends upon the relative proportion of activity on graphics and calculation. *FasterPC* shines whenever graphics are predominant. Comparing the performance of the graphics demo programs running under the two emulators confirms the claims in the manual of a phenomenal speed increase of up to 900%.

Unlike *PCEm*, *FasterPC* does not attempt to emulate the 8087 floating point co-processor. Programs involving a significant proportion of floating point operations will run much slower on FasterPC. To compare general calculation speed, I installed Borland's *Quattro-Pro 3*, which involves decompressing a large number of files using both emulators. The times were not significantly different. An estimate of the effective processor speed using the DOS utilities program *PCSHELL* was confusing. *PCSHELL* suggested that *FasterPC* was 10% slower than *PCEm* but, paradoxically, the latter took 66% longer to derive the information.

SOUND

Judging by the demo programs provided, the sound performance of *FasterPC* is way ahead of *PCEm*. The demonstration program *ANTHEM* plays a rather fine, if ridiculously fast, version of the national anthem. Under *PCEm* the result is interesting but describing it as music would be debatable. From a sound point of view there is no contest.

DISPLAY LIMITATIONS

FasterPC only copes with CGA (low resolution) and VGA (high resolution) displays. For reasons we cannot cover here (but which are explained at length in the manual) EGA graphics are not supported. I found many programs which I run regularly failed with the message 'Attempt to change to an unsupported video mode detected'. The problem appears to be that programs which might be set up to use VGA may at some points use an EGA mode causing the emulator to quit. This means that programs such as *Quattro-Pro* have to be set up to use only CGA modes.

As far as games are concerned, not being of the generation which learned to twiddle a joystick at the same time as learning to walk, I had to rely on freebie disks glued to the covers of PC magazines. These ran with limited success. Some failed because of the VGA/EGA problem, others ran faster than under *PCEm* but still too slow to be usable.

THE BAD NEWS THE GOOD NEWS

Overall the bad new is that *FasterPC* has its limitations. There are no expanded memory facilities, there are limitations on the allowed display modes, and there is no floating point co-processor emulation. However, many of these are under consideration for a future version. Add to that the lack of multi-tasking and on the face of it there is no contest compared to *PCEm*. Or is there? To compare the two directly as we have been doing is unfair. *FasterPC* has been written to solve particular problems - poor display speed and sound emulation - and it solves those remarkably well. When we take that into account, and the good news that the price is only £19.95 including post and packing (no VAT), then we can be more generous.

PRODUCT INFO

Product	*FasterPC*
Supplier	*D Lawrence* *33 High Street* *Farnborough* *Hampshire GU14 6ES*
Price	*£19.95 inc. p&p* *(no VAT)*

In his fact sheet the author suggests that *FasterPC* is useful as a 'second string' in case *PCEm* does not run particular programs. That probably understates the potential market. There is now a large body of older PC software designed originally to run CGA displays. DOS games and utilities of this era can now be bought very cheaply often as shareware. Most of this is very likely to run better under *FasterPC* than under *PCEm*. Then again, for those considering buying a PC emulator *FasterPC* is a useful low cost introduction to the PC world. Try it. If it runs the software you want - fine; if it doesn't you have lost little.

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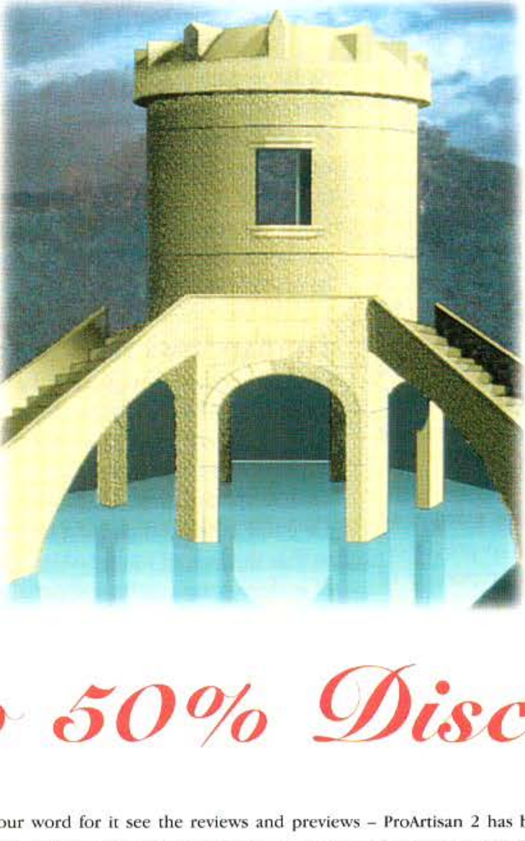

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Wimp Topics - Using Features of RISC OS 3.10

by Richard Hallas and Alan Wrigley

This month's Wimp Topics looks at a few of the new features available in RISC OS 3.10 (and in some cases RISC OS 3.00), and how to use them in your programs. In most cases you will need to check that the computer has RISC OS 3.10 installed before trying to access its facilities. A method for doing this was described in Hints & Tips, RISC User 6:9, but there are also other ways to achieve the same end. For example, OS_Byte 129 will return a value depending on the operating system currently in the machine. It should be called with zero in R1 and 255 in R2, whereupon the value returned in R1 will be &A1 for RISC OS 2.00, &A2 for 2.01, &A3 for 3.00 or &A4 for 3.10 and 3.11. To differentiate between, say, RISC OS 3.10 and RISC OS 2, you could do the following before calling "Wimp_Initialise":

```
SYS "OS_Byte",129,0,255 TO ,os%
IF os%<&A4 version%=200 ELSE
```

version%=310 version% can now be passed directly to "Wimp_Initialise".

THE DragASprite MODULE

Under RISC OS 2, dragging an icon around on the Desktop (for example from a save box) resulted in a dotted outline of the icon's bounding box accompanying the pointer on its travels across the screen. This is controlled by the SWI "Wimp_DragBox", which an application would call upon receiving an event from the Wimp indicating that the user had initiated a drag on that icon. Various types of drag boxes are available with this SWI, but the most convenient for the purposes of a save box is known as "fixed size rotating dash" - the dotted outline referred to above.

RISC OS 3.10, however, provides a new module called DragASprite, which allows an actual sprite to be dragged around the Desktop instead of the dotted outline - normally you would use the sprite which is displayed in the icon, but in fact any sprite can be specified. The module is very easy to use. When you want to start your drag operation, instead of calling "Wimp_DragBox" as before, use the call:

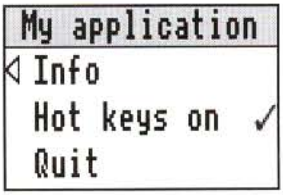
```
SYS "DragASprite_Start",flags,sprite
area,sprite name,drag box,user bounding
box (the last parameter is optional).
```

The individual bits of *flags* must be set up as follows:

0 & 1 : horizontal position of sprite in box
00=left, 01=centre, 10=right
2 & 3 : vertical position of sprite in box
00=bottom, 01=centre, 10=top
4 & 5 : bounding box
00=whole screen, 01=window, 10=user
6 : bounding box applies to
0=box, 1=mouse pointer
7 : drop shadow
0=off, 1=on

Therefore, a *flags* value of %11000101 would mean: drop shadow on, bounding box applied to the pointer, the sprite can move around the whole screen, and the sprite is centred.

The *sprite area* parameter must either contain a pointer to your own sprite area, or else 0 for the system sprites or 1 for the Wimp sprite area.



Menu produced by Listing 2

The *drag box* parameter is a pointer to a 16 byte block containing the sprite starting co-ordinates in the form of x min, y min (inclusive), x max, y max (exclusive). Normally these values will be the current co-ordinates of the icon, which you can find using "Wimp_GetWindowState" and "Wimp_GetIconState", exactly as you would have done when using "Wimp_DragBox".

If you set bits 4 and 5 of *flags* to %10, then you must specify the area within which the drag is to be restricted, by giving the user bounding box in R4. This must also be a pointer to a 16-byte block in exactly the same way as for the drag box.

When your drag has finished, and you receive a terminating User_Drag_Box reason code, simply include a call to "DragASprite_Stop" (with no parameters) in the procedure which processes the end of a drag.

The DragASprite module takes a copy of the sprite you specify, so you need not worry about deleting or modifying it once the drag has started. If there is not enough memory for DragASprite to work, the standard rotating-dash box will automatically be used instead.

Listing 1 gives a complete procedure to drag an icon containing a text file sprite. This would be called when a Mouse_Click event is reported with a button value of 16 or 64 (drag with Adjust or Select respectively). The icon number is passed as the parameter.

Listing 1

```
   DEF PROCdrag(ic%)
   :
   REM get window screen co-ordinates
   !block%=whandle%
   SYS "Wimp_GetWindowState",,block%
   x%=block%!16:y%=block%!28
   :
   REM get icon work area co-ordinates
   block%!4=ic%
   SYS "Wimp_GetIconState",,block%
   :
   REM calculate icon screen co-ordinates
   !block%=block%!8+x%
   block%!4=block%!12+y%
   block%!8=block%!16+x%
   block%!12=block%!20+y%
   :
   REM call DragASprite
   SYS "DragASprite_Start",%11000101,1,"f
ile_fff",block%
   ENDPROC
```

There is one further point to note about DragASprite. Since not all users may want the facility, Acorn has provided a means for the user to define whether sprite dragging should be used, by setting bit 1 of byte 28 of the CMOS RAM. If your programs are to be used by other people, you should examine this bit to see if it is set before using DragASprite in preference to the standard dotted outline box. This can be done as follows:

```
SYS "OS_Byte",161,28 TO ,,val%
spritedrag%=((val% AND 2)=2)
```

spritedrag% will now be TRUE or FALSE depending on whether the bit is set or not.

INDIRECTED MENU TITLES

Under RISC OS 2, menu titles were limited to a maximum of 12 characters. With RISC OS 3.10, menu titles can be indirected, allowing for both longer titles and the use of outline fonts. Creating a longer title is fairly simple. First set up an indirected string containing the required title. Instead of placing the title directly at the start of the menu block as before, put a pointer to the string there in the same format as for a normal indirected text icon. In other words, the first word points to the string, the second word to a validation string (if any), and the third word gives the length of the title string. The first few lines of Listing 2 demonstrate this. Create the rest of the menu as normal, and when finished, set bit 8 of the menu flags for the very first item (the line beginning menu%!28 in the listing). This indicates to the Wimp that it should treat the title as indirected.

LEFT-HANDED MENUS

One of the more obscure features of RISC OS 3.10 is the 'left-handed menu'. In such menus, ticks appear down the right-hand side and submenu pointers down the left. Opening submenus will therefore cause the menu tree to be built right-to-left instead of the normal left-to-right. This facility is provided as part of Acorn's growing awareness of the importance of international markets, to support right-to-left languages such as Hebrew and Arabic.

Even in left-to-right languages, this feature can prove quite useful if you want to open a menu close to the right-hand side of the screen, as you can then avoid several submenus piling up on top of each other. It is very simple to produce a left-handed menu. All you have to do is make the first character of the menu title a backslash ("\"). It is only necessary to add the backslash to the main menu title, as RISC OS 3.10 will modify the submenus automatically. The RISC OS 3 PRM states that text justification is reversed for right-handed menus, with left justified text becoming right justified and vice versa. However, under RISC OS 3.10 at least, this is not the case, text being justified to the same margin as with a right-handed menu. In order to justify it to the right, you must set the right justified bit of the menu icon flags (bit 9).

Listing 2 gives a menu creation procedure which illustrates both an indirected title string and a left-handed menu, as shown in Figure 1. It should be called with the address of the menu block as the parameter. If the items are to be right-justified, alter the menu icon flags to &7000221 in all cases.

Listing 2

```
DEF PROCcreatemenu(menu%)
:
REM set up indirected title
REM note backslash for left-handed
DIM title% 15
$title%="\My application"+CHR$0
menu%!0=title%
menu%!4=-1:REM no validation
menu%!8=15
menu%!12=&70207:menu%!16=212
menu%!20=44:menu%!24=0
:
REM set bit 8 of 1st item's flags
menu%!28=256
:
REM assume info box handle=info%
menu%!32=info%:menu%!36=&7000021
$(menu%+40)="Info"
menu%!52=1:menu%!56=-1
menu%!60=&7000021
$(menu%+64)="Hot keys on"
menu%!76=&80:menu%!80=-1
menu%!84=&7000021
$(menu%+88)="Quit"
ENDPROC
```

PROVIDING INTERACTIVE HELP ON MENU ITEMS

RISC OS 3.10 applications can provide interactive help on menu items as well as normal windows. This is achieved by using the new Wimp SWI call "Wimp_GetMenuState". This call will return information about the currently highlighted menu item. It is a general purpose call, but one of the most obvious uses is for providing help on menus. In your routine that handles interactive help, your program will respond to a window handle which is sent to it by the Help application. If you receive a window handle which does not correspond to any of your program's windows, it will be a menu handle. In such a situation you should issue the following call:

```
SYS "Wimp_GetMenuState",1,buffer,window,icon
```

window and *icon* are the handles sent to you by Help, while *buffer* is a pointer to a block that will contain the result of the call. The buffer size should be at least as many words as there are menus open plus one; e.g. for a menu with two submenus open, you would require a buffer of four words (16 bytes). The results placed in the buffer are in exactly the same format as those returned by a Wimp poll Menu_Selection event. Each word will contain the number of the highlighted item in each successive menu, starting from 0, and the list will be terminated by -1 after the last menu item. You should use this information to determine which item is highlighted, and return help on it in exactly the same way as for a window.

Remember that help-sensitive menus are only available to 'RISC OS 3 aware' applications, so you must pass a version number >=300 in your call to "Wimp_Initialise", otherwise your application will not receive the menu help request at all.

READING WINDOW INFORMATION

It is sometimes necessary to make a call to "Wimp_GetWindowInfo", for example to find out the address of an indirected title bar string prior to altering the title. Under RISC OS 2 this call returned the complete window definition, including all its icons. If you had created a number of icons after creating the window, the parameter block for the call could be considerably larger than the one you used to create the window in the first place. Even worse, if you were reading the contents of another application's window (as done for example by AutoSave in RISC User 4:8), you would not necessarily know how large a block you would need, and if you underestimated you could crash the computer.

With RISC OS 3.10 you can arrange for "Wimp_GetWindowInfo" to return just the window information without the icons. To do this, set the bottom bit of R1 (the address of the block), as follows:

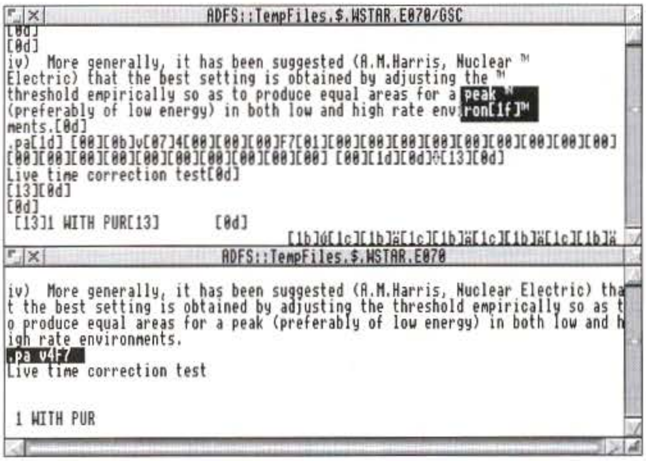
```
SYS "Wimp_GetWindowInfo",,block%+1
```

You can then be sure that the block returned will always be 88 bytes long.

The PC Emulator Survival Guide (7)

Gordon Gilmore provides some timely advice on converting DOS files for import to RISC OS applications, and you don't need the PC Emulator at all for this, just RISC OS 3.

This part of the Guide is going to look at transferring files from DOS to RISC OS applications. In many ways this is a bit of a cheat since we won't be using the Emulator at all this month. On the other hand the issues touched on may be of wider interest to those who don't use the Emulator but might, for example, want to take their beautifully DOS word-processed documents from work and DTP them without taking out a mortgage to buy Ventura Publisher or the like. What are the chances of transferring such documents to Ovation or Impression?



```
[0d]
[0d]
iv)  More generally, it has been suggested (A.M.Harris, Nuclear ™
Electric) that the best setting is obtained by adjusting the ™
threshold empirically so as to produce equal areas for a peak ™
(preferably of low energy) in both low and high rate environ[1f]™
ments.[0d]
.pa[1d] [00][0b]v[07]4[00][00][00]F7[01][00][00][00][00][00][00][00][00][00]
[00][00][00][00][00][00][00][00][00][00] [00][1d][0d]◊[13][0d]
Live time correction test[0d]
[13][0d]
[0d]
 [13]1 WITH PUR[13]       [0d]
                                   [1b]ó[1c][1b]ä[1c][1b]ä[1c][1b]ä[1c][1b]ä
```

```
iv)  More generally, it has been suggested (A.M.Harris, Nuclear Electric) tha
t the best setting is obtained by adjusting the threshold empirically so as t
o produce equal areas for a peak (preferably of low energy) in both low and h
igh rate environments.
.pa v4F7
Live time correction test


 1 WITH PUR
```

Stripping text from a Wordstar file - before and after

We are going to concentrate on text because the use of DOS bit-mapped (BMP, PCX, TIF etc.) and vector-mapped (DXF) picture files in RISC OS applications has been covered from time to time in RISC User before. The current series of articles on Working with Images is also relevant.

DOS text files can come in a many formats. On a simple level we have simple ASCII files, and on increasing levels of complexity, word processor and DTP files.

Simple ASCII files are likely to have filename extensions such as TXT, DOC or BAT, and transferring these to RISC OS is straightforward. One simply needs to reverse the process described in part 2 of the *Survival Guide* (RISC User 6:5), where we looked at converting RISC OS format text files to DOS format. Load them into Edit and remove all the redundant carriage return characters, [0d], and the [1a] end of file marker. If you are using Ovation it is even easier - just hold down Ctrl while dragging the file into the Ovation document and the offending characters are converted to spaces.

While this is fine for simple files such as AUTOEXEC.BAT, comprising short individual lines, neither of these options is totally satisfactory for continuous text files. For example a .TXT text file produced by the Windows Notebook application will have a linefeed character at the end of each line within the body of the text, which will get in the way of reformatting in the RISC OS application. One solution is simply to use Edit with magic characters enabled to replace '\x0d\n' by a space. Since this would also get rid of your paragraphs, a better approach is to use the wildcarded search to replace:

```
'✘0d$@'
```

by:

```
'space?0'
```

(**✘** is here intended to be the hex wildcard character Alt-132). This rather cryptic command only replaces those carriage returns and linefeeds which are followed by an alphanumeric character. Even that will not work unless paragraphs are indented and double spaces within text will have to be sorted out manually (see also the more detailed article on *Search and Replace* in RISC User 6:6).

Word processor files can be daunting at first sight (try loading a WordPerfect document into Edit and browse through it - if you don't have a DOS file handy try a substantial Ovation document to get the flavour). The first thing we must accept is that there is no simple way we can translate the style and formatting information in the word processor file. But we can relatively easily recover the text which we can then load into our RISC OS application.

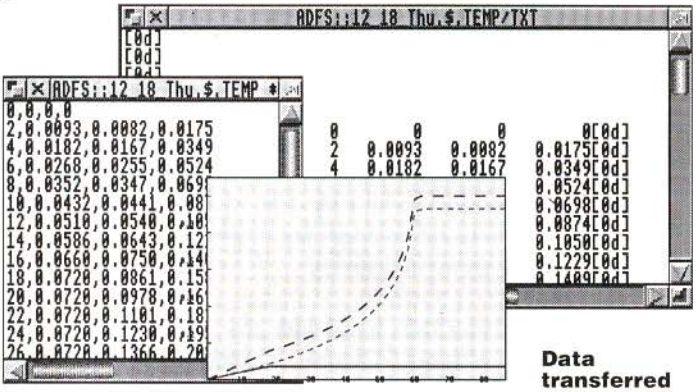
Word processor files often have a header, substantial in some cases, and sometimes a trailer carrying the formatting and style information. There will often be format characters within the text as well. All these need to be stripped out. Sometimes particular characters may have to be swapped for others. Surprisingly, all of this can be done with Edit (or, indeed, DeskEdit), a little bit of common sense and some idea of what to expect.

WORDSTAR FILES

It would perhaps be easier to understand if we use a real file as an example. The first illustration shows part of a Wordstar file called E070/GSC loaded into Edit. The top half shows the original file, and the bottom half the stripped file. It's immediately obvious that many of the extraneous characters are non-printing. These can be got rid of easily. One feature of word processor files is that they often have one or more characters marking the end of the line. In the file shown the marker is the '™' character (see the highlighted area). The screenshot in figure 1 also shows an end-of-line hyphen marked as [1f]. Sometimes other types of hyphen are indicated by different characters. The procedure for stripping Wordstar files is as follows:

Load the file into Edit and select the Search/Replace function (F4). Before each operation press Home to set the cursor at the start of the file. With magic characters set, search for '™\n' and replace it with nothing (™ is Alt-141). This gets rid of all the floating end of line markers. Now switch to wildcards and search for ~[--~$] and again replace it with nothing (note the space in the search string). The leading ~ means that all characters except those between the brackets, that is space to the tilde and the newline ($), will be replaced. That removes all but the normal printable characters. If there are any special characters which you would want to retain you could put them inside the brackets along with the others.

That almost completes the job. If we look through the file now, we find odd bits of text such as the '.pa V4F7' shown in the lower part of the screenshot. This is a remnant of the formatting for a new page. We can get rid of this with a wildcarded replace of '\.p*.$' (i.e a real full stop followed by any number of characters (*.) and a newline) by nothing. The result is an almost clean file with just a few remaining rogue characters which can easily be spotted and removed. The plain ASCII file can now be loaded into the RISC OS application.



```
[0d]
[0d]
```

```
0,0,0,0
2,0.0093,0.0082,0.0175
4,0.0182,0.0167,0.0349
6,0.0268,0.0255,0.0524
8,0.0352,0.0347,0.069
10,0.0432,0.0441,0.08
12,0.0510,0.0540,0.10
14,0.0586,0.0643,0.12
16,0.0660,0.0750,0.14
18,0.0720,0.0861,0.15
20,0.0720,0.0978,0.16
22,0.0720,0.1101,0.18
24,0.0720,0.1230,0.19
```

```
0         0         0         0[0d]
2    0.0093    0.0082    0.0175[0d]
4    0.0182    0.0167    0.0349[0d]
                         0.0524[0d]
                         0.0698[0d]
                         0.0874[0d]
                         0.1050[0d]
                         0.1229[0d]
```

Data transferred from a DOS spreadsheet to a RISC OS graph plotter

WORDPERFECT FILES (.WPF EXTENSION)

WordPerfect files need a little more tidying up before using the heavyweight 'remove-everything-but' operation. Firstly there will be a number of stray carriage returns in the file which should be converted to spaces (search for '\x0d' with magics set). Looking through a WordPerfect file, you will more than likely find a variety of characters splitting words. These can all be replaced by a dash (i.e. minus sign) by searching for '©™' where the characters are Alt-169 and Alt-170. Now all the extraneous characters can be replaced using the ~[--~$] wildcard expression as above. There will still be some garbage to remove, but this will be mainly from obvious header and heading style codes.

MICROSOFT WRITE FILES (.WRI)

These files are relatively simple in structure. There is a short header followed by the text and then a long trailer which presumably holds the detailed formatting information. It is easy to remove the header and trailer en bloc. The text has no end-of-line markers other than carriage return characters for text breaks which can easily be removed by Edit. If you are transferring to Ovation it is sufficient to load the file into Edit, mark the text block and drag the icon from Select/Save into Ovation with Ctrl held down.

SPREADSHEET DATA

Although we can't always use DOS spreadsheet files directly in RISC OS applications, there is scope for transferring data from one spreadsheet to another via CSV (comma separated value) files. I do this regularly because my DOS spreadsheet produces its output in bit-mapped PCX format, and I prefer Draw files in my DTP documents. I transfer the final spreadsheet results via a CSV file to ChartWell or PlotGraph to create my diagrams (an example is shown in figure 2).

If your DOS spreadsheet does not output data directly in CSV format, it might be able to read it in. As long as the printer output file is text rather than a bit image we can recover the text from it.

Load the printer image file into Edit and strip out all the obvious extraneous material, such as the inevitable '0d's, so that you are left with a number of lines containing nothing but data separated by a variable number of spaces. We can now convert this to CSV format as follows:

Use Edit to replace '%space' by a comma with wildcards set. This will convert any group of spaces to a comma. If this leaves commas at the beginning of the lines you can get rid of these by replacing '\n,' by '\n' with magic characters set. The file is now in a suitable form for reading into any RISC OS application which will accept CSV input.

GENERAL POINTS

It would make sense to spellcheck the converted file to detect any remaining odd characters, and then a careful read through would be a wise move to make sure that all is well.

Quotation marks can cause something of a problem. The normal computer system font uses characters 34 (") and 36 (') for single and double quotes. Strictly speaking these are primes and some smart word processors might use the 'genuine' "articles" instead. These characters (144, 145, 148 and 149 respectively) will be removed unless you include them in the exclusion string (e.g. ~| --’’“”$|) when you remove all the irrelevant characters.

It isn't until you start to use Edit for this sort of purpose that you realise how powerful its Search and Replace function is. (Incidentally, due to circumstances too complicated and embarrassing to relate, I have in the past been able to use it to recover text from corrupted Ovation files.)

FOREWARNED/FOREARMED

Of course, the simplest thing would be to try to get output from the word processor in plain text in the first place. My, bitter, experience is that that is easier said than done. To the typical word processing person what could be plainer than a WordPerfect file, and no amount of pleading will get you anything else. Even so, stripping the text from the word processor files could be marginally simpler if they were prepared with their eventual fate in mind. There is no point in formatting, tabulating and generally making the document look nice if it's all to stripped out afterwards. Here are a few simple *don'ts* which might help.

- Don't use bold, italic, underline text styles etc.
- Instead of tabs, use a 'dead' character such as | which can be replaced later.
- Don't put lines round tables. Leave that for the DTP program or whatever.
- If you are using Greek or other special characters use codes to indicate them. For example *a might indicate a Greek alpha.
- Ignore headers and footers.
- Don't go putting in diagrams.

The result may not be pretty but will be much easier to transfer. Unfortunately, the more conscientious the typist the less likely you are to end up with a document which doesn't look good! Never mind - just grin, bear it and get to grips with Edit. It's a lot less trouble in the long run than alienating the typing pool.

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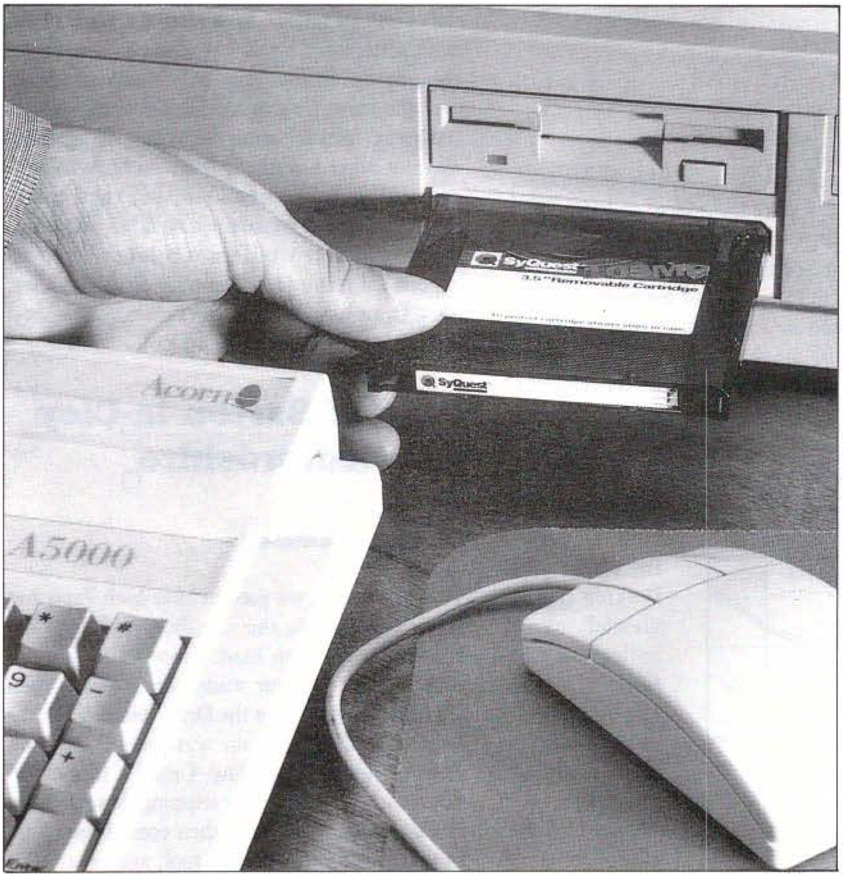

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Into the Arc: Integrating Draw and Paint

by Mike Williams

One of the key features of the Archimedes, particularly since the advent of RISC OS 2 some five years ago, is the way in which multi-tasking applications can be used co-operatively. Given sufficient memory, several applications can be installed in your machine, and a piece of work can be processed and manipulated by each application as required. Thus there is no need for every application to try and provide all facilities; each can perform a specific job and be tuned to the needs of a more tightly focused task.

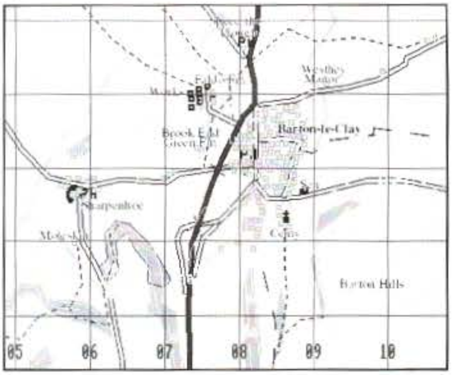
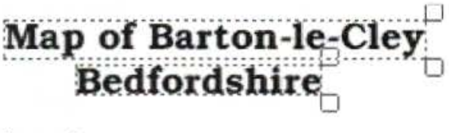


Figure 1. The original map saved as a sprite

In effect the Desktop can be viewed as a collection of tools (the applications), each with its own set of functions. Working in the Desktop involves using each tool as required in order to accomplish a piece of work. Often, different objects will be created as the task progresses, with these objects being combined to achieve a more complex whole. That's a very abstract approach, but that is the essence of multi-tasking on the Desktop whether the focus of our attentions is DTP, CAD, music, art or whatever.

Two excellent applications to experiment with in this context are Paint and Draw, which under RISC OS 3 are built into the system ROM, and thus require relatively little additional memory spaceas they run from ROM. I propose to look at how these two applications can be used for simple but effective work, and how their functions can be combined to provide more than either can accomplish on its own.

In RISC User 6:9 I reviewed Clares' *Topographer* and the map which I constructed was saved as a sprite (see figure 1). I have decided that I want to embellish this further by placing the name of the main settlement (spelt variously as Barton-le-Cley, Barton in the Clay, etc.) in a fancy panel over the map. Unfortunately, Paint only allows text to be inserted using the system font, which was not what I wanted, whereas Draw allows any outline font to be used. But then again, although I could construct a suitable text panel in Draw, Paint would not allow this to be imported directly into the sprite area. However, using Draw and Paint together gives you the best of both worlds as we shall see.



Map of Barton-le-Cley
Bedfordshire

Figure 2. The text as entered

To make a start, we need to have both Paint and Draw installed on the icon bar, my sprite file containing my map loaded into Paint, and an empty Draw window visible on screen. I then dragged the sprite into the Draw window. Next I set about constructing the text panel in a vacant area of the Draw window. I used a font called Bookmark Demi 14pt, by selecting these through Draw's *Style* option, and then entered two lines of text. Click on the Select tool, and select each line in turn (the first with Select, the second with Adjust - see figure 2), before using the *Select* option in Draw's main menu to group these as a single object. I also decided at this stage that the text looked too small, so I resized it by dragging on the bottom right-hand 'ear' until I judged the size to be suitable.

I now wanted to make the lettering look rather more interesting, so with the two lines of text still selected (indicated by the surrounding red rectangle), I used the *Select* option once again to *Convert* to path. Once this has been done, the text can be treated as any other path object, and I set about using the *Line colour* and *Fill colour* options from Draw's *Style* menu to change the appearance of the text (see figure 3).

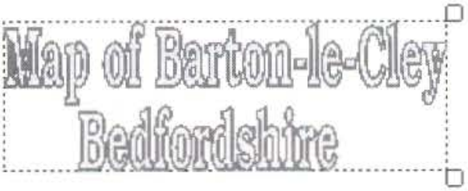


Figure 3.
The text styled and filled

For clarity I decided to place the text I had created in a panel which I wanted to style so that it appeared to be recessed within a frame. I started by simply creating two rectangles over the top of the text, one slightly inside the other in size, with the larger near black in colour, and the inner one a lighter shade of grey to give the impression of a frame. A little unevenness in frame thickness was adjusted manually by selecting the inner frame. Using Draw's *Edit* option, causes the control points at each corner to appear, and these were carefully dragged to achieve a reasonable appearance. By this time the original text had completely disappeared behind the two new frames, but I left everything in this state for the time being.

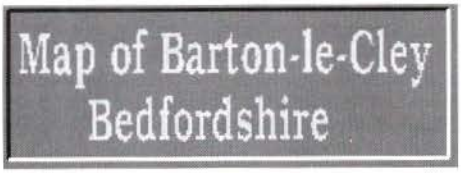


Figure 4.
The text panel complete

To make the panel within the frame appear recessed, I assumed that light was falling from top left, and therefore added two black lines inside the frame to the top and left, and two white lines to the bottom and right. In each case I selected the colour and line width (0.5) before using Draw's line tool to position the two lines. Lastly, varied clicks on the *Front* and *Back* options in the *Select* sub-menu eventually rearranged the various layers to achieve the desired Effect (see figure 4). Getting the layers in the right order can be tricky, particularly when objects are more or less the same size and difficult to select correctly. Maybe I was lucky, but the final result was obtained fairly easily.

Using the Select tool, I drew a rectangle around the text panel and used the Draw menu to group all these layers as a single object which I then dragged into position over the map. To finish the job off, I decided to put a similar frame around the map as a whole. The finished result still existed as a Draw file, so to put it back into sprite format I displayed the Draw window at full size, and clicked on the Paint icon on the icon bar to select the Snapshot facility. I positioned the Snapshot rectangle as closely as possible round the frame and loaded the resulting sprite directly into paint. I tidied up the sprite by zooming up to four times normal size, so that pixels were identifiable, and then used Paint's *Edit* option to shave off some extra unwanted rows at top, bottom, left and right, before saving the sprite. The final result looked good enough to hang upon the wall (figure 5).

SOME BASIC DRAW SKILLS

In Draw, the Select tool is the bottom one represented by a diagonal arrow. Always select this tool before trying to select an object by clicking over it with the Select button. To select more than one object click with the Adjust button over the second and subsequent objects. It is often preferable to group a set of objects as a single object. Note that many of Draw's menu options will only be usable if a suitable object has been selected first.

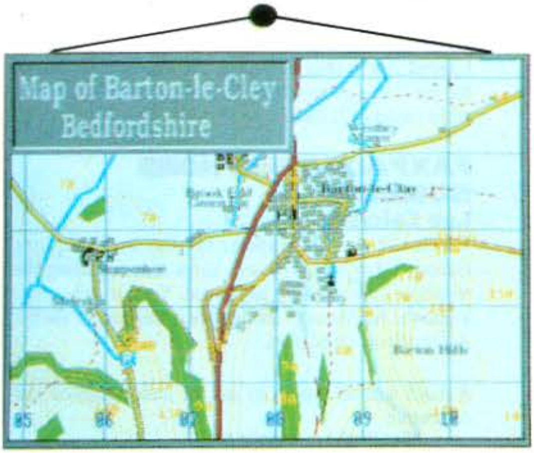


Figure 5.
The final result

Importing sprites into Draw, where text in outline fonts can be added, and then reconverting to sprite format using Paint's Snapshot facility is a useful technique. It can equally be used when designing application sprites (see *Into the Arc* for last month) if any characters are needed in an outline font. The whole process provides an excellent example of how much more can be achieved on the Arc when two or more software tools are combined together within the Desktop.

HINTS & TIPS

Keep sending in your hints on anything relevant to the Archimedes range. And remember, we pay for every hint we publish.

USING THE FILER_RUN COMMAND

Nigel Cook

RISC OS 3's *Filer_Run* command can be used very effectively for running applications together. For example, if you always use *CharSel* at the same time as Ovation, you can use the *Filer_Run* command to run CharSel whenever you double-click on Ovation. Simply add the following line to Ovation's *!Run* file, just before the *RMEnsure Ovation* line:

```
Filer_Run <pathname>.!CharSel
```

where *pathname* is the directory in which you keep CharSel. The reason for adding this line near the end of the file is to prevent CharSel running if there is an error while running Ovation.

FAXPACK TELEPHONE NUMBERS

Lee Calcraft

If you use the file transfer facility on Computer Concepts' *FaxPack*, you will know that supplying the telephone number is not automated. You can either type it into the *FaxManager* configuration window, or use the *AddressBook* application.

A much smarter way is to use the undocumented star command:

```
*SetNumber <number>
```

Typing *SetNumber "0123 456789" at the star prompt will automatically place this number into *FaxManager's* configuration window (which need not be open), replacing any previously held number.

This means that you could keep a set of Obey files on your Pinboard or sticky backdrop, one for each fax destination. You could add a confirming beep to make a two-liner, thus:

```
*SetNumber "0123 456789"
*Sound 1 &16F 70 4
```

RESETTING THE SYSTEM FONT

Alan Bonsor

Many programs, particularly games, have the irritating habit of changing the system font and not bothering to restore it when they are terminated. It is a little known fact that there is a *FX command that will restore the system font, obviating the need to load a *BBC System Font* file or reset the machine. Simply press F12 to access the command line and enter:

```
*FX20
```

You could even create an Obey file to do this, and place it on your Pinboard or sticky backdrop.

RISC OS 3 QUIT BUG

P Pratt

It is well-known that if you have more than one pending Obey file, you will get a crash when you elect to shutdown the Desktop. But the problem is much worse than this. If you have more than one application whose !Run file does not terminate when its !RunImage is run (for example there might just be an extra linefeed at the end of the !Run file, or there might be a number of commands to be executed once the main application terminates - such as unsetting system variables etc.) you can get into deep trouble.

If you install a couple of such applications (or two copies of the same application) on the icon bar, and then quit the right-most one, the whole Desktop will hang. Nice one Acorn! The RISC User *BugBuster* module (RISC User 6:1) will get you out, but not much else.

AUTO-EMPTYING BINS

Lee Calcraft

The RISC User *Dustbin* (RISC User 5:1) has a built-in auto-empty feature which is activated each time the application is installed. Any binned files will thus be lost after a reset if the bin is auto-booted. This is normally OK, but if you want to prevent this on a particular occasion, avoid auto-booting your machine, and use the command line to copy your binned files from *!Dustbin.Rubbish* to somewhere safe before *Dustbin* is run.

USING TOP BIT CHARACTERS IN IMPRESSION

Mark Wiggin

Now that *Impression* supports the use of *top bit* characters, such as ç, é, ü, etc., the abbreviations dictionary can be used to enter the correct characters automatically whilst you are typing. This does away completely with the need to stop the flow of typing in order to enter foreign language characters; once set up, there is no further need to use *Chars* or a similar program.

First of all, ensure that you have *Expand abbreviations* turned on. This is set in the *Preferences* window, accessed from *Impression's* icon bar menu.

In the *Abbreviations* dialogue box, type the following:

```
elite <Alt 233>lite
```

where *<Alt 233>* means hold down the Alt key and type 233 on the numeric keypad. Add the word to the abbreviations dictionary by clicking on *Add Word*. Whenever you now type the word *elite*, it will automatically be replaced by *élite*. Repeat this process for any other words containing accents, etc., that you use. Don't forget to save the new abbreviations dictionary in *Impression's Auto* directory, so it's loaded every time you run *Impression*.

OUTLINE FONTS FOR COLOURING IN

Nigel Cook

Following on from the hint about creating *Draw files for colouring in* (RISC User 6:7), here's a tip on how to do the same thing for outline fonts. Under RISC OS 3, enter the text in *Draw*, and click on the *Convert to path* option in the *Select* menu. Then use the *Style* menu to set the text's line colour to black, and fill colour to none. RISC OS 2 *Draw* does not provide a *Convert to path* option, so you will need to use a utility such as *DrawFont* (RISC User 4:8) to perform this step.

CHANGING THE COMMAND LINE PROMPT

Anthony Powell

Under RISC OS 2 it was fairly difficult to change the default prompt at the command line to display the pathname of the currently selected directory; usually requiring a module or utility to perform the task.

RISC OS 3 makes this process is very much simpler. Just add the following two lines to your Desktop Boot file:

```
     SetMacro CLI$Prompt <FileSwitch$ADFS$CSD> *
     Dir $
```

The reason it needs the *Dir $* command is that RISC OS 3 doesn't set the system variable *FileSwitch$ADFS$CSD* until the command has been entered. The only problem with this method is that it only works for one filing system at a time; you would need to change *ADFS* to *SCSI* for it to work with a SCSI hard drive.

PROBLEMS WITH GETKEY

Alan Bonsor

If you have been experiencing problems running certain applications; for example double-clicking on a *Templates* file causing a *Too Long* error instead of loading *FormEd*, or the *ImageCat* application (RISC User 6:8) failing to run correctly, you may be interested to know of one possible cause and a solution.

The problem is caused when the system variable *Alias$@RunType_FFB* is redefined to a string whose length is much longer than the 22 character default. This variable sets the default *run* action for Basic files, and is usually set to *Basic -quit |"%0|" %*1*.

However, the very useful *GetKey* module, part of the *Desktop File Loader* application (RISC User 3:6 and *Wimp Programmers Toolkit*), changes this variable to check whether the Control key is pressed when a Basic file is double-clicked on, and if it is, loads the file into Basic instead of running it. The changed definition is *GetKey|M If |<Get$Key>|<>1 Then Basic -quit |"%0|" %*1 Else Basic -load |"%0|" %*1*, and would probably be part of your Desktop Boot file, the line before the *GetKey* module is loaded.

The solution is unfortunately fairly tedious, as it involves modifying the *!Run* file of each affected application; specifically *FormEd* and *ImageCat*. At the start of the application's *!Run* file, add the following line to restore the *RunType_FFB* variable:

```
     Set Alias$@RunType_FFB Basic -quit |"%%0|"
%%*1
```

and at the end of the *!Run* file, add the following to redefine it for *GetKey*:

```
     Set Alias$@RunType_FFB GetKey|M If
|<Get$Key>|<>1 Then Basic -quit |"%%0|" %%*1
Else Basic -load |"%%0|" %%*1
```

The only side effect of this solution is that while any modified application is running, the Control-double-click feature will not work.

USING PCOL WITH THE CANON BJ10ex

Paul Pibworth

Canon's BJ10ex printer does not use the usual reset code of 27,64. This can cause some problems with the *PCol* Basic program printing utility (RISC User 4:9). The solution is to change lines 960 and 2150 of *PCol's* source code to the following:

```
     960 SWI vdu+27: SWI vdu+91: SWI vdu+75: SWI
vdu+1: SWI vdu+0: SWI vdu+0
     2150 SWI vdu+27: SWI vdu+91: SWI vdu+75: SWI
vdu+1: SWI vdu+0: SWI vdu+0
```

DETECTING ARM2/250 OR ARM3

Atle Mjelde Bårdholt

Here is a useful routine for checking whether your application is running on an ARM2/250 or ARM3 processor. This would enable the program to take advantage of the extra power of the ARM3 if it was present; for example, providing better graphics, etc.

```
     SYS "XOS_CLI","Cache On" TO ;arm%
     IF arm% AND %0001 THEN
       ARM3 = FALSE
     ELSE
       ARM3 = TRUE
     ENDIF
```

TRACKING AND KERNING IN IMPRESSION

Max Haltermann

Although *Impression* supports both horizontal and vertical kerning, this facility is rather limited as it has to be applied manually and to single characters. What's more, there is no quick way of globally removing kerning from a document or applying tracking to a heading.

However, all is not lost. To remove kerning, save the document as a *Text* file, with styles, into *Edit* or *DeskEdit*. All kerning will appear in the form *{kern xx yy}*, where *xx* and *yy* are the horizontal and vertical kerning values. Use the find and replace facility to remove them, and then save the file back into *Impression*.

Applying this process in reverse, you could add kerning to specific groups of letters; for example *Ws* and *as*. In the text editor, simply search for *Wa* and replace it with *W{kern -50 00}a*.

Tracking is just as simple. In *Edit* or *DeskEdit*, click on *Wildcarded Expressions* in the *Find* window and enter '.' (i.e. a single full stop) in the *Find* icon and *&{kern xx 00}* in the *Replace with* icon (*xx* should be a tracking value). The '.' means any character, and the & means the found character. Save the file back into *Impression*, and that section will have perfect tracking.

REALLY OBSCURE ERROR MESSAGES

Pieter Schmidt

One of RISC OS's more obscure error messages is the incredibly helpful *% in module title*. What this actually means is anybody's guess, but here are a couple of points about it so you will know what's happened if it occurs on your system.

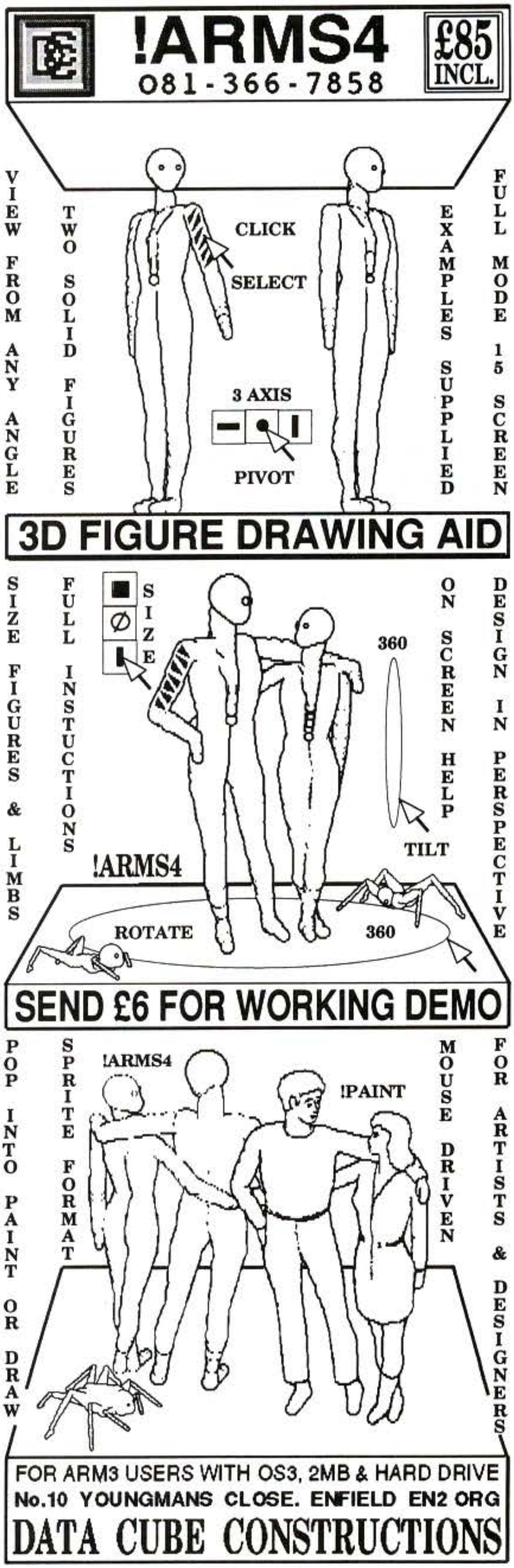
The error will usually occur while you are developing a module or using a very old module; for example, the *UserVoice Generator* modules (version 1.00) dated 16 Jan 1988. If a module fails to *die* properly when Killed, Cleared or ReInitialised, either because it doesn't release all claimed vectors or it performs some other close down action incorrectly, it will end up sitting in the *modules* list with a workspace address of *DEADDEAD*. Any further attempt to RMLoad or RMRun a module with the same title will cause the *% in module title* error to occur. The only way to clear the module from the modules list is to reset your system.

FAULTY VOICE MODULES

Pieter Schmidt

One family of modules that can cause the *% in module title* error, are the *UserVoice Generator* modules used by two games on the RISC User *ArcOmnibus* games disc. They have a version number of 1.00 and are dated 16 Jan 1988. Although the modules have the same title, they are not identical, as they contain different voices. The modules work properly on RISC OS 2, but crash on RISC OS 3. Their problem is that when they are installing their various voices, they fail to store the used voice numbers correctly. When they subsequently attempt to release the voices, they try to remove voice 0, which doesn't exist, generating an *Illegal voice index* error. As they do not use the *X* form of the SWI involved, which all modules should use, they cannot complete their close down action, and thus fail to die.

The UserVoiceGenerator modules on the ArcOmnibus disc have now been "repaired". They can be obtained by returning your original ArcOmnibus disc to the "Publications Department" (usual address). This only applies to the modules on this disc; the UserVoiceGenerator modules differ from application to application.



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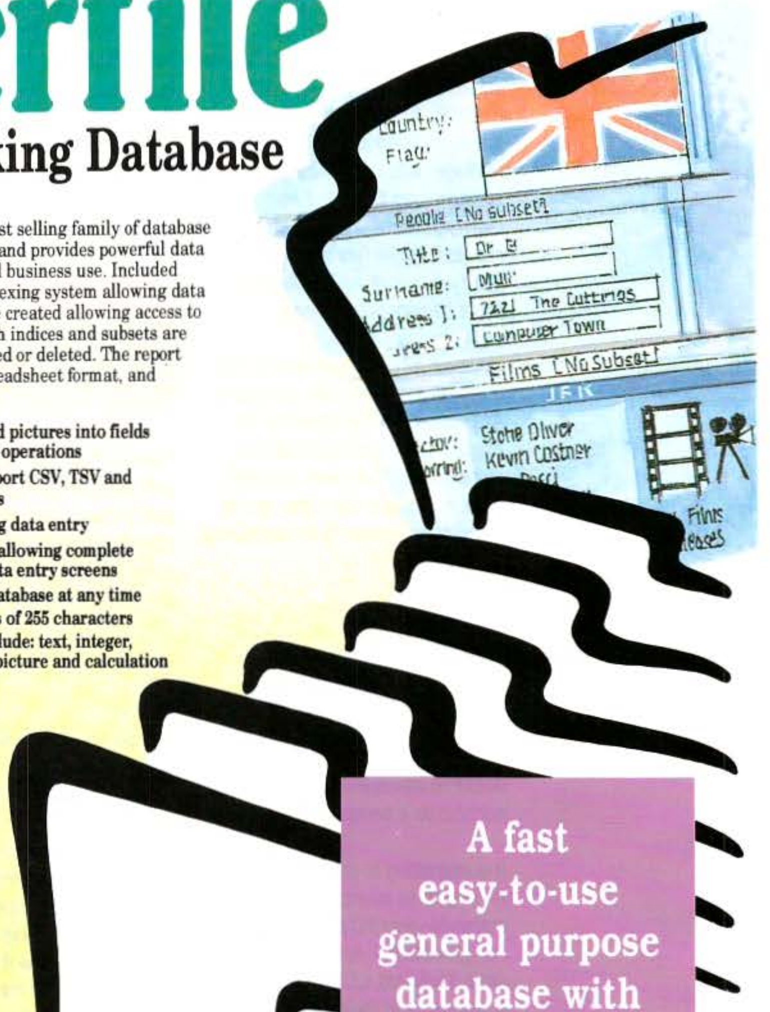

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WRITE-BACK

WHAT FUTURE FOR ACORN'S A4?

I am writing in response to your editorial in the June issue of RISC User on the future of the A4 portable. Frankly, I don't think Acorn are serious about the A4, which I find odd. To all intents and purposes the A4 is an A5000 in a portable package, with the inevitable compromises that result from battery power and the small size of the case. Acorn has done a pretty good job overall, and an A4 Mk II might be very good indeed.

However, what is really wrong with the A4 is that it is far too expensive. Acorn seems to be unsure of the role of the A4 and are content to produce small numbers, at a high price, to sell to a tiny niche market. They do not appear to be committed to supporting it.

If the price was reduced to a more reasonable level, roughly equivalent to the more powerful PC portables, I am sure it would sell in large numbers, as myself and other owners of Desktop Acorn machines would be interested in purchasing a portable as a second machine.

It is interesting to consider why the A4 should be so expensive. It uses many standard PC portable components (i.e. floppy drive, hard drive, keyboard, LCD, battery, PSU & charger, and the case). I assume that Acorn doesn't pay any more for these than other manufacturers. The only unique part of the A4 is the PCB with the ARM 3 and RISC OS. One of the claimed advantages of ARM chip sets was that they were cheap to manufacture. The answer can only be that the A4 is only produced in tiny quantities, rather than being mass-produced like the A5000, hence the high price.

Michael Lowe

We have discussed these points with Acorn. Their spokesman said that the A4 was made in large batches in order to keep the price down. Acorn's view is that the A4 is competitively priced when comparing like with like. However, we were unable to obtain any insight into future developments of the A4.

COMFORTING THOUGHTS ON PCS AND APPLES?

I read with great interest your latest editorial in RISC User 6:8, and it sent shivers down my spine. How often have we not stumbled on silly programs or difficult-to-install hardware. Why do the clever guys not make it easier for dumb users?

But then I beg to differ, as my experiences have been almost exclusively with CP/M machines, PCs and Apples.

It has become almost a rule that no hardware or software can be installed in a PC without very experienced help. Jumpers on cards have to be set, or the computer will refuse to recognise it. Then the software makes a mess of your ***Config.sys*** *or* ***Autoexec.bat*** *files (like some of the early games on the Archimedes which reset your computer, making it forget language, country and podules!).*

Not even Apples are perfect. Yesterday I played Spectre, a high-tech tank simulation game over a network. On my display the enemy tanks were invisible! No error messages or anything. Also, quite a lot of installations end in failure or are unbelievably complex (usually due to idiotic copy-protection schemes - installing Quark Xpress took a couple of hours).

However, using SCSI on my A3000 has always been a delight with my Oak-supplied interface and software, even if you do have to set the jumpers on the drives or dial in the right ID.

CC's Scanlight Junior interface went directly from the box into the computer and worked flawlessly. I have much more that I could say about silly protection schemes, and dongles that work, usually, but not always.

The worst aspect of the Acorn machines are their graphics and printing capabilities. Even CC manages to get far better prints from ArtWorks when printed on a PC, running CorelDRAW! This is stupid. Colourwise, the Archimedes are in the kindergarten, while PCs and Apples are in secondary school. Without expensive hardware (Turbo drivers) it seems to be impossible to print a page from Impression on my Canon BJ-330 printer without a blank page in between. As there is just one podule slot on an A3000 I can't use a Laser-Direct!

Tord Erikson, Sweden

In one sense it is comforting to know that PCs and Apples can also be difficult to use, but is that an excuse for Acorn's Archimedes?

FRUSTRATIONS OF AN ARCHIMEDES USER

Your leading article (Editorial, 6:8) had such a depressingly familiar ring to it that I felt prompted to put pen to paper.

I don't know which piece of software you wrote about, but I do know that I *had exactly the same problem with a piece of hardware ("!Printers needs PDriver 3.16 or later"). I neither know nor feel that I ought to know the inner workings of applications to get them to co-operate.*

To be fair to the suppliers, when I phoned them, they were able to tell me how to put it right. To be objective though, you are spot-on when you say it should not happen. In this case the suppliers are obviously aware of the problem; but if they cannot put it right they should at least include information with the product.

However, that was not the end of my problems, but in the event the cause was found to lie with equipment from other multi-national companies with which I was communicating, rather than with the supplier of my purchase. But the reality is that the onus is on my supplier to ensure that their equipment works with that of others.

The normal course of action in this situation is to return the product and go to a vendor who can provide a product which will do the job. But in the Acorn world the choice just isn't there. With the possible exception of the classroom, Acorn machines are becoming increasingly marginalised as a serious platform for professional use.

My computer is a tool to be used. It is not a clever piece of engineering merely to be admired. If I can't get the software and hardware I want when I want them, then the answer is as it has always been - when you have decided what you want to do go out and buy the platform on which it can be done.

What should Acorn do? They should follow Apple and the PC market - bring prices down substantially. Giving added value such as hard drives is not enough. The PC 486 card should be built in to the A5000/A540 at no extra cost to give Acorn users cost-effective access to the PC world. As users we would then have the choice between expensive professional PC/Windows software and inexpensive but limited RISC OS software.

Keith Brewster

AND NOW FOR THE GOOD NEWS

I thought another note was due in praise of RISC User. You keep a very high standard. In particular, I like the series ***Into the Arc****, which I find, although they are naturally quite technical, reasonable for the masses to understand.*

I am a great fan of Ovation and am always finding something new in it. Bill Nichols has been writing some good articles. The facts are all in the manual, but his writing presents it in a very readable form. One small criticism, and this is not always so, but sometimes when the text refers to diagram 3, the number 3 is nowhere to be found.

Finally, ChartWell is a good program, but don't forget the hatching upgrade.

L.J. Colman

Future development of ChartWell, including crosshatching as an alternative to colours, is still under consideration.

THE RISC USER WIMP LIBRARY

What has happened to this excellent series? Has it stopped following Mark Moxon's departure earlier this year, or do you intend for it to continue?

This series started off with so much promise, faded and then stopped at part 4, and then was briefly resurrected in volume 6 only to stop again. At that time I wrote and received a reply outlining what was soon to appear, i.e. RAM transfers, Pane Windows, Templates, Text editor windows, etc. Only the former ever appeared. The "Wimp Library" if completed could be another such series as the high quality articles in previous series like "Mastering the Wimp", "Exploiting the Wimp", "Introducing C" etc.

David Leckie

Like many series, the Wimp Library started with an excellent pool of resources which have been exploited. Staff changes during this year have had some effect, but it was never our intention that the Wimp Library should continue indefinitely. Its role has partly been overtaken by our recent series *Wimp Topics*. We are now considering further additions to the Wimp library, and any contributions for this will be warmly welcomed (and paid for).

Points Arising . . .

THE DOS SURVIVAL GUIDE PART 2 (6:5)

In April's RISC User, page 59, at the bottom of the box [0a] should be [1a]. The word '(linefeed)' added by the editor by way of explanation should be '(Ctrl-Z)'. Sorry if this confused anybody. Incidentally, unless the RISC OS text file is terminated by the tilde, '~', the automatic conversion will not work.

ArcScan DATA

We regret that the ArcScan index for RISC User 6:9, supplied on that issue's magazine disc, updates the index file for Volume 6 incorrectly. We are therefore supplying an updated version of this index, and the index for 6:10, on this month's magazine disc. A simple application is also provided to facilitate the repair of the index file.

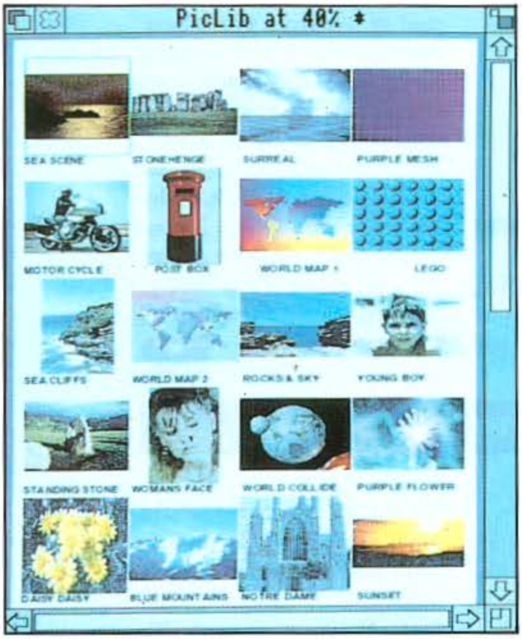
What's Cooking at CC?

In this new series we talk to developers about their latest news and plans for the future.

This month Charles Moir, the Managing Director of Computer Concepts, writes about CC's progress over the past few months, and what we can expect to see in the not too distant future. So now over to Charles . . .

FEATURES NEW TO IMPRESSION 2.19

Impression 2.19 is the latest version of our DTP package. The main new feature of this version is its support for *ArtWorks* files. It's now possible to simply drop an *ArtWorks* file directly onto a frame in exactly the same way as a Paint or Draw file. Since one of the important features of *ArtWorks* is its ability to show drawings anti-aliased, this is also incorporated. Along with this is a new WYSIWYG menu option that provides four quality settings for *ArtWorks* files - *outline, simple, normal* and *anti-aliased* - providing the same type of control as the rotating knob on the *ArtWorks* info bar.



Using Impression as a picture database

The *ArtWorks* rendering code has been made available to third party developers so that hopefully other applications will also start supporting *ArtWorks* filetypes. In fact the first announced product to support *ArtWorks* files is a new version of the *DataPower* database application from Iota. We know of several other significant applications providing *ArtWorks* support that will also be launched over the coming months.

Another small but useful change that came along in version 2.19 is to do with panning Draw files within frames - in *Impression* you do this just by dragging with Select. Version 2.19 now only renders Draw or *ArtWorks* files as a simple outline while you perform the drag. This greatly speeds up the the movement of such graphics within frames.

BEYOND 2.19

Some people have pointed out that, apart from the recent 2.19 version, there hasn't been a significant upgrade to *Impression* for some time. Does this mean that development of *Impression* has stopped? Well, in fact there was an entirely new version of *Impression* that was developed over a large part of last year, namely the word processor part of Acorn's *Advance* integrated application.

For those who are not aware, this is an integrated suite of word processor, spreadsheet, database and graph plotting program, sold by Acorn. Each part was developed by a different company - Iota for the Database and chart plotter and Clares for the spreadsheet.

Those who have used *Advance* may have noticed that although it has limited DTP capabilities, it does have a few features that are new, and indeed better than *Impression*. For example, it supports a central clipboard system so that data can be transferred directly to the other applications in the suite - i.e. cut from one and paste into another. Other improvements include the support of true bold and italic effects, a better mail merge facility and a simpler and more powerful ruler system.

So, you might ask: when are these improvements going to make it into *Impression*? Well, it can be revealed that at the October Acorn World Show we hope to release two new versions of *Impression* that will replace the current *Impression Junior* and *Impression II* products. Anyone buying *Impression* after the 1st September will be able to get upgrades free of charge. Current users will be able to upgrade for a small charge.

While I can't reveal everything that's going in the new versions, I can say that they will incorporate all the *Advance* facilities (and are *Advance* file compatible). In addition, the area that both new versions will address is that of 24-bit colour support. The Acorn platform has been behind the industry standard in this respect and has not supported a standard 24-bit sprite format. Acorn have finally settled on a 24-bit sprite format and we've been working to build this support into *Impression*.

In addition, there will be many other additions to make the entry level *Impression* both a better word processor and a more powerful desktop publishing platform. For example, it will support embedded graphics frames and a system of styles (like *Impression II*). Both versions will incorporate many relatively small, but nonetheless useful changes. For example, it will support the RISC OS 3 auto-kerning feature and the ability to select and move regions of text using just the keyboard - a feature that *Windows* programs have always been good at at.

24 BIT COLOUR

The whole area of true colour image support will become increasingly important as time goes by, and there are several factors conspiring to make this area significant. Firstly, and most importantly, there is now an official 24-bit sprite format - this enables developers to build in support for true colour 24-bit images into their applications. Secondly there are important developments in low cost colour printers and colour scanners, and we believe that by the October show both these areas will be better supported than at present. It is our hope that by this October it will be possible to scan a 24-bit image, drop the picture into *Impression*, and print it as a proper 24-bit colour image on a low cost colour inkjet printer.

Both versions of *Impression* (and hopefully *ArtWorks* as well) will support 16 and 24-bit sprites, and in addition will have direct support for 24-bit TIFF files. TIFF files are probably the most common industry accepted 24-bit graphics standard - used by both Macintosh and PCs. Both versions will also provide anti-aliasing of Draw files - a first for the Acorn machine.

The new version of *Impression II* will add support for more powerful and more professional desktop publishing areas. For example, it will support text tracking as part of a style definition. It will include built-in full colour separation facilities (obviating the need for the *ExpressionPS* utility). This will also be able to separate 24-bit RGB draw and sprites files, and more significantly, 32-bit CMYK format *ArtWorks* files and 32-bit CMYK TIFF images (pre-separated CMYK TIFF files are important in colour publishing work). This version will also support embedded EPS (Encapsulated PostScript) and allow screen angles and density to be set on a frame-by-frame basis for typesetting work.

We believe that these and many of the other new features will make *Impression* a real contender in the professional publishing market against packages such as PageMaker 5 and Quark XPress 3.

ROTATING SHORTCUT

Of course there are features of the previous releases of *Impression* that are still relatively unknown. One of these is the short-cut for rotating graphics. While the rotation angle can be set in the *Alter graphics* dialogue, a far easier way is to drag with the Adjust button. This allows you to interactively rotate the graphics around the centre of the frame. In fact this is one area that will surprise PC and Mac users since there are no software applications on their machines that can even come close to providing this real-time picture rotation. This is especially impressive when rotating large sprites, something that takes a very long time on other machines.

IMPRESSION PICTURE DATABASE

People do use *Impression* in more and more innovative ways, doing things we never even dreamed of when it was written. We recently heard of a customer using *Impression* as a simple picture database or filing system. The idea is quite clever and uses the Master Page system along with *Impression's* ability to save individual graphics files. First set up a master page with a number of small frames on each page - organised as a grid - say four across by five down. Then all you do is drop whatever sprite, *Draw* or *ArtWorks* files you want into these frames. Each page will then have 20 small 'thumbnail views' of your graphics. Once you've filled a page, simply select the *Insert page* option to create another empty template page with the blank frames. When you want to use the graphic, simply click on the picture and use the *Save Graphic* menu option to transfer the picture directly to other applications or to disc.

Of course it's rather easy to take this further by allowing textual captions to be associated with each graphic (i.e. just a small blank frame under each graphic frame). In this you could put the filename, or more usefully a textual description of the picture. Then simply use the Search dialogue to locate any graphic by keyword.

Our thanks to Charles for his insight into CC's plans - The CC stand at Acorn World 93 should be well worth visiting.

C Notebook: Hints & Queries

Compiled and Linked by Lee Calcraft

RANDOM SEEDING

Ian Gordon

The ANSI C function *rand()* can be used to generate random numbers, and by supplying an integer argument we can confine the result to a particular range. For example

```
number=rand(100);
```

will assign a random number in the range 0-99.

The random number generator can be seeded using the function *srand()*. But to get a truly random pseudo-random number you need a seed which is different every time that your program is run. The answer is to use the current time as the seed. To achieve this, just make the following call once at the start of your program:

```
srand(time(NULL));
```

You will need to *#include <stdlib.h>* for the random functions, and *<time.h>* for *time()*.

TEMPLATE LIBRARIES

Tony Shew

Desktop C comes with a template file containing a number of standard templates to use in your own programs. If the templates are all saved as individual template files, they can be dragged into a FormEd window to build up the templates file needed for a project in a pick and mix manner.

LEAVING ROOM FOR ICONS

Lee Calcraft

As we have mentioned in previous C-Notebooks, the function *wimp_get_wind_info()* will crash if you call it without leaving enough room for the icons attached to the corresponding window. The easiest way to avoid this is to use *malloc()* to reserve a sufficiently large block of memory for the window and all its icons.

The following function, which causes a nominated window to be redrawn, uses this technique. It takes two parameters: the window handle and the size of the workspace required for the window and its icons. The official requirement is 88 bytes for the window definition itself plus 32 bytes for each icon. Those of a cautious disposition may care to add a few bytes for good measure.

```
  void gen_redraw(wimp_w handle,int work
space)
  {
     wimp_redrawstr r;
     wimp_winfo *winf;

     if ((winf=malloc(workspace))!=0)
     {
       winf->w = handle;
       wimp_get_wind_info(winf);

       r.w = handle;
       r.box.x0=0;
       r.box.y0=winf->info.ex.y0;
       r.box.x1=winf->info.ex.x1;
       r.box.y1=0;
       wimpt_noerr(wimp_force_redraw(&r)
);

       free(winf);
     }
     else werr(FALSE,"Insufficient memor
y - use Task Manager, and retry.");
  }
```

USING werr() WITH VARIABLE ARGUMENTS

Sanjay Pattni

The function *werr()*, used for reporting errors in Wimp programs, may be used with a variable number of arguments, in the same way as *printf()*. This enables a program to provide more informative error messages. For example, you can actually specify the name of a faulty or missing file:

```
werr(FALSE,"File %s missing",filename);
```

where *filename* is the name of the file that could not be *found*.

This can also be useful for debugging, as it permits data to be written to the error box, and pauses the program while it is read.

BUG IN wimp_set_icon_state()

David Lenthall

There is a bug in the function *wimp_set_icon_state()* which appears when you try to set the background colour of an icon. This occurs because the *wimp_iconstate* flag word has been defined as an *int* (using an *enum*) rather than an *unsigned int*. The upshot is that if you supply a flag value with bit 31 set, as you would if you wanted to set a background colour in the range 8-15 (Wimp colours dark blue to light blue), the compiler will report a *signed constant overflow* error.

Please send us your C hints - all published hints will be paid for.

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? TECHNICAL QUERIES

Alan Wrigley answers your questions on Squash, module functions, dragging files to the icon bar and disabling interrupts.

Q *Dear Sir*

I have come across some files which I can see are squashed, as when I load them into Edit they start with the string "SQSH". However, when I try to decompress them using Acorn's Squash they remain unchanged. Why?

Brian Borrows

A If a file is dragged to the Squash application, the filetype will be examined. If it is type &FCA (Squash), the file will be presumed to be already squashed, and will therefore be unsquashed, with its original filetype restored from the information at the head of the squashed file. If it is of any other filetype it will be presumed to be unsquashed, and Squash will attempt to squash it, putting the letters "SQSH" at the start of the squashed file followed by information about the filetype, length and date stamp.

It follows that if a squashed file is given another filetype, Squash will attempt to squash it again, which will obviously result in no difference if the original squash process did its job properly. I suspect that this is what is happening in your case, and the simple answer is that you must alter the filetype before you can unsquash the files.

Q *Dear Sir*

Is there a published list for the functions of the more commonly used modules other than those described in user manuals? As an example I noticed that the !System directory on the March RISC User disc contained the modules DDEUtils and FrontEnd. I would like to know more about their function and how they might be used in other applications.

David Broadbent

A The implementation of modules is one of the features that makes RISC OS so powerful. Unlike application workspace, which may be paged in and out according to which application currently has control of the computer, the memory in the RMA is always accessible. This makes it ideal for tasks such as implementing SWI calls and star commands, which could arrive at any time from any application, and for routines that handle interrupts and events, which again might occur at any time. These are among the primary uses for modules, though not the only ones.

For the purposes of answering your question, you could consider modules as broadly belonging to two groups: those which provide functions intended to be used by other programs, and those which provide specific support for the application to which they belong (examples of the latter being Ovation and DeskEdit). In both cases, however, the actual function of the module is largely irrelevant and of no practical use to the user. Provided the modules and the applications which use them are correctly written, the user doesn't even need to know they are there, let alone what they do. For this reason, you are only likely to find descriptions of modules and their functions in manuals aimed at programmers. Star commands available to the user at the command line will be documented in user guides, but the function of the module which provides them will not. You can also find out the star commands recognised by a module by typing *Help <module name> at the command line. Many of the commands themselves have help messages too, accessed in the same way with *Help <command>.

All the modules available in the RISC OS 3 ROM are fully described in the PRM, and any modules supplied by third parties which are available for general use should be described in the technical documentation which comes with them. There are programs available which will extract information from modules currently installed in your machine. Rheingold's new Vigil debugger, for instance, has facilities to display information such as SWI and command lists and workspace contents for any module, and disassemble the code (in fairness to readers I must declare an interest in this product). InfoMod (RISC User 5:4) also gives some information on modules.

The two modules you mention are part of Acorn's Desktop Development Environment (DDE). The FrontEnd module provides a common Wimp front end for simple tasks which are not themselves multi-tasking. A complete description of the module and how to use it is given in the documentation with the DDE. On the RISC User disc in question, it was required by the QIndex program (see also the article Creating DIY Multi-tasking Applications, RISC User 5:7). The DDEUtils module provides some facilities that are sometimes needed by FrontEnd, and was also included on the disc for this reason.

However, DDEUtils also has another important function, which is to provide throwback facilities. Throwback is a mechanism whereby a program which is processing a file can signal to an editor that an error in the file is to be displayed. For example, a compiler producing an ARM code program from a source file may encounter an error in the source such as a bad instruction or an undefined variable. By using throwback, it can tell an editor such as DeskEdit to load the source file and display the line containing the offending instruction.

Q *Dear Sir*
I have noticed that many applications successfully load files of a type which they recognise even if the file is dragged to a blank section of the icon bar. What code do I need to add to my own programs to make this happen?

Keith Vernon

A When a user drags a file from a Filer window to somewhere else on the Desktop, the owner of the destination window is sent a DataLoad message (action code 3) which specifies the window handle, and also the icon handle if the drag ended over an icon. If the destination window is the icon bar, the message is sent to the task which owns the destination icon. To cater for either of these situations, a task must recognise and respond to the DataLoad message. However, if the drag ends at a blank area of the icon bar, there can be no "owner" in the same sense. In this case the Wimp broadcasts a DataOpen message instead, just as if the file had been double-clicked. In this way an application which recognises the filetype can load the file in the same way.

To handle this in your own program, therefore, all you need to do is to ensure that it responds to both the DataLoad and DataOpen messages.

Q *Dear Sir*
Is there any way of turning off all interrupts on the Arc, analogous to the use of SEI and CLI on the BBC micro's 6502 processor? I need to do this to ensure proper operation of an interface card, which must respond to incoming data without the risk of missing any.

Colin Attenborough

A Interrupts under RISC OS are, as you might expect, a good deal more complex than they were on older Acorn computers. Numerous devices, including expansion cards, can generate interrupts; each potential source of interrupts is given a number, and also a software vector which points to a routine called a device driver which specifically processes interrupts from the corresponding source. Interrupts are of two kinds: normal (IRQ) and fast (FIQ). FIQs are generated by devices that need to have their requests processed quickly, such as disc drives.

Disabling IRQs is very simple: just call the SWI "OS_IntOff", and to re-enable, "OS_IntOn". There are no parameters for either call. However, it is vital that you only disable interrupts for the absolute minimum of time (a maximum of 100 microseconds according to Acorn). Exceeding this time will have an adverse effect on other parts of the system that use interrupts - for example jerky pointer movements.

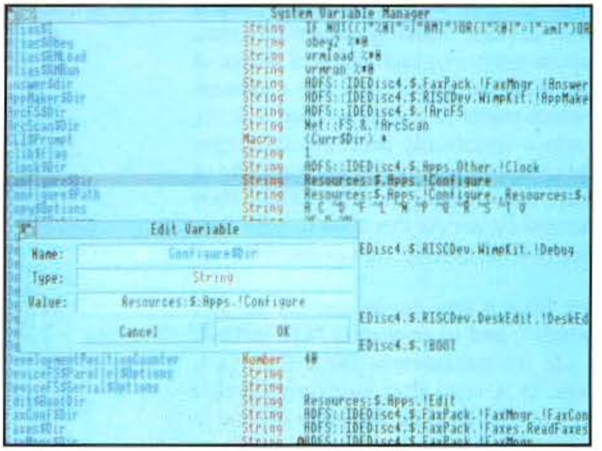
Disabling FIQs is a little more complex. First you must be in a privileged processor mode (e.g. Supervisor mode). To do this you call SWI "OS_EnterOS" with no parameters (though you may already be in Supervisor mode if you are inside a module's initialisation, finalisation, service call handler, SWI handler or command handler routines. Having done this, you can then disable IRQs by setting bit 27 of the program counter R15 using the TEQP instruction, or FIQs by setting bit 26. They are re-enabled by clearing the appropriate bit again.

Acorn recommends, however, that you should not disable FIQs unless you are actually using them. If the data transfer on your expansion card is so time critical, you might consider generating FIQs yourself as these take priority over IRQs. Alternatively, you could incorporate some buffer RAM on your card to reduce the criticality.

A full explanation of interrupts is beyond the scope of this answer, and it is strongly recommended that you study the chapter in the PRM devoted to the subject if you wish to generate or disable interrupts.

System Variable Manager

by Jonathan Hunt



```
System Variable Manager
String   IF NOT(("%W1"="("AM1")OR("%W1"="("am1")OR
String   obey2 %*0
String   vrmload %*0
String   vrmrun %*0
String   ADFS::IDEDisc4.$.FaxPack.!FaxMngr.!Answer
String   ADFS::IDEDisc4.$.RISCDev.WimpKit.!AppMake
String   ADFS::IDEDisc4.$.!ArcFS
String   Net::FS.&.!ArcScan
Macro    <Curr$Dir> *
String   1
String   ADFS::IDEDisc4.$.Apps.Other.!Clock
String   Resources:$.Apps.!Configure
String   Resources:$.Apps.!Configure.,Resources:$.
```

Edit Variable

Name: Configure$Dir

Type: String

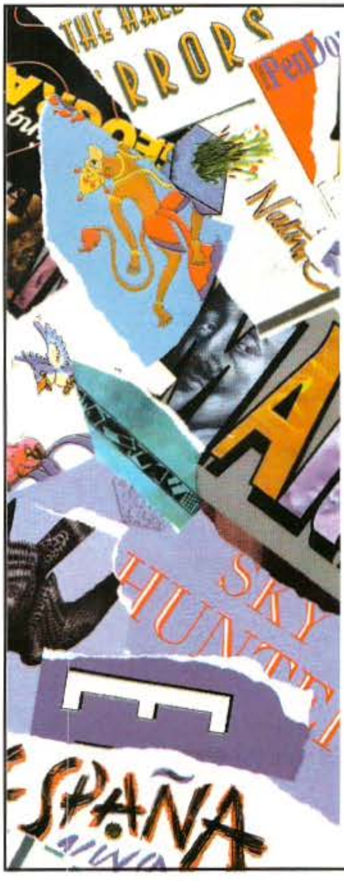
Value: Resources:$.Apps.!Configure

Editing a system variable with the System Variable Manager

How many times have you double-clicked on a text file, expecting it to load *DeskEdit*, and found the file has loaded *Edit* instead; or had a Sprite file load *Snippet* instead of *Paint*? The culprit is something called a *system variable*.

System variables control things like how the time and date are displayed, where scrap files are created, and what application is run when you double-click on a file. Applications use system variables to control their behaviour. For example, *Edit* uses them to store your choice of display font, background colour and so on. They can also be used to create alternative *star commands* - the command to catalogue a disc, *., isn't actually a real command, but merely an alias for **Cat*.

System Variable Manager provides you with extensive control over the system variables, allowing you to create, rename and delete them, and modify their contents and type. You can also search for specific variables, and obtain various statistics on them. A very useful feature of this application is that you can save a system variable file that contains your preferred "run actions" for each filetype. Whenever you now discover that another application has changed one of them, simply double-click on the system variable file to restore it to your usual setting.



Education Software Programming Opportunities

Longman Logotron is looking for RISC OS programmers with the skills and aptitude to work on developing exciting educational applications for younger children.

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Some examples of previous programming work would be very helpful.

Nicola Bradley
Longman Logotron
124 Cambridge Science Park
Milton Road,
Cambridge CB4 4ZS

Template Information Utility

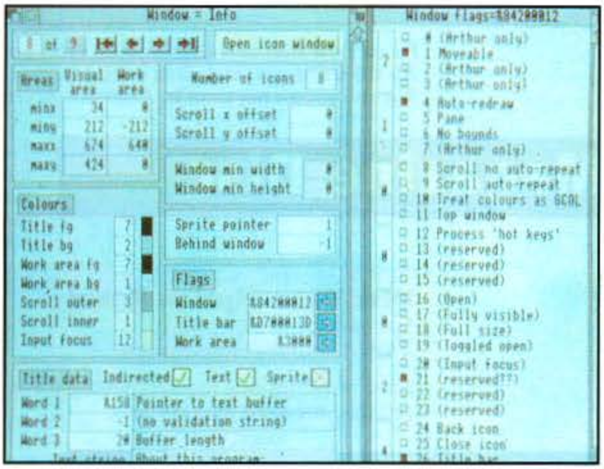
by Graham Crow

One of the shortcomings of many template editors is that they rarely provide all the information you require when developing an application.

When writing a program, it's useful to know how much memory to allocate for window and icon definitions. To calculate this, you need to know how many icons you created in each window. With certain template editors, the only way to find this out is to count them manually, and if an icon is covered by another, you could forget that it's even there. Or perhaps you've forgotten what validation string you used in a certain icon, or you want to check whether you changed the button type of an information icon from "click-drag" to "never".

Tempi is the perfect application for finding out all of these details, and more. It is very simple to use, and allows you to quickly and easily obtain almost all of the information you could require. Best of all, *Tempi* requires only 64K of memory, unlike an editor which could need ten times that amount. *Tempi* is compatible with both RISC OS 2 and 3.

For reasons of space, both applications described on these pages are supplied only on this month's magazine disc.


Window = Info

1 of 9

Open icon window

Areas

	Visual area	Work area
minx	34	0
miny	212	-212
maxx	674	640
maxy	424	0

Number of icons 8

Scroll x offset 0
Scroll y offset 0

Window min width 0
Window min height 0

Colours
Title fg 7
Title bg 2
Work area fg 7
Work area bg 1
Scroll outer 3
Scroll inner 1
Input focus 12

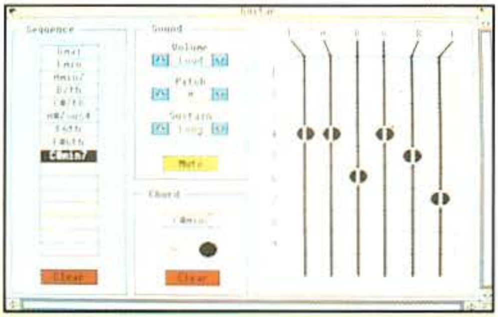
Sprite pointer 1
Behind window -1

Flags
Window &84200012
Title bar &D700013D
Work area &3000

Title data Indirected ☑ Text ☑ Sprite ☐
Word 1 A150 Pointer to text buffer
Word 2 -1 (no validation string)
Word 3 20 Buffer length
Text string About this program

Window Flags=&84200012
☐ 0 (Arthur only)
■ 1 Moveable
☐ 2 (Arthur only)
☐ 3 (Arthur only)
■ 4 Auto-redraw
☐ 5 Pane
☐ 6 No bounds
☐ 7 (Arthur only)
☐ 8 Scroll no auto-repeat
☐ 9 Scroll auto-repeat
☐ 10 Treat colours as GCOL
☐ 11 Top window
☐ 12 Process 'hot keys'
☐ 13 (reserved)
☐ 14 (reserved)
☐ 15 (reserved)
☐ 16 (Open)
☐ 17 (Fully visible)
☐ 18 (Full size)
☐ 19 (Toggled open)
☐ 20 (Input focus)
■ 21 (reserved??)
☐ 22 (reserved)
☐ 23 (reserved)
☐ 24 Back icon
☐ 25 Close icon
■ 26 Title bar

Tempi's information windows



RISC *user* Volume 6 Special Disc

PREVIEW OF OUR NEW RELEASE

We are once again releasing one of our special discs - this time for volume 6. This disc will contain a selection of the best items from volume 6 plus a number of new and updated applications as indicated below.

The Volume 6 Special Disc will cost just £6.95 (inc. VAT and p&p) and will be available from mid-October.

PROVISIONAL CONTENTS -

1. **Pinboard Backdrops** A selection of mood backdrops for use with the Desktop Pinboard
2. **Font Manager** An application which provides a simple and ideal way of managing the many fonts now available on the Archimedes.
3. **Guitar Player** A highly playable implementation of a guitar. Create and store chords; use the mouse to strum the strings; play along with RISC.
4. **Stencil** Use this application with Draw files to create a multitude of stencil effects.
5. **Outline Fonts** Two completely new and original outline fonts - Dynamic Shaded and Rob Roy, in normal and italic styles.
6. **Harry Organiser** RISC User's own personal organiser now updated for the Volume 6 Special Disc.
7. **Art Package** A complete new painting package capable of producing stunning effects.
8. **ScanDisc** Use this updated application to create ArcScan compatible and ASCII files of all your favourite discs. Ideal for cataloguing sprites, clip art, PD discs etc.
9. **Terminator** A brand new novelty which produces startling consequences when you come to the end of a session.
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- A3000, 4Mb RAM, 45Mb SCSI HD, serial port, RISC OS 3.1, colour monitor £600 o.n.o. Tel. Lanarkshire 0698 384145.

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- 8Mb A540, RISC OS 3.1, 120Mb SCSI hard disc, Acorn I/O podule with IIC interface, BEEBUG 2nd floppy disc interface, Acorn AKF12 monitor, technical reference manual, Programmers Reference manuals, all offers considered. Dictionary of the Living World CD ROM, Revelation 2 (on CD ROM and floppies), BEEBUG C Development system version 1.6, all offers considered. Tel. Cardiff 0873 853538.

- RISC OS 2 Programmers Reference Manual, nearly new £35 o.n.o. Tel. Leeds 0532 751817.

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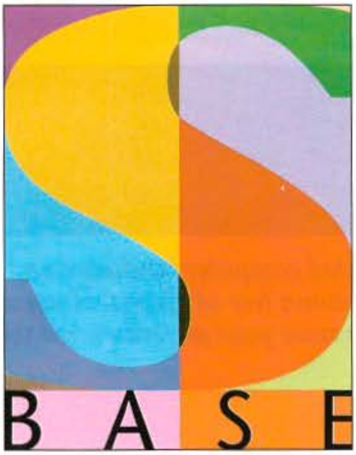
Advertisers Index

Acorn Computers	*76*
Clares Micro Supplies	*46*
Colton Software	*74*
Computer Concepts	*34*
Datacube Constructions	*58*
Longman Logotron	*68,72,73*
Morley Electronics	*65*
Norwich Computer Services	*53*
RISC Developments' Software	*15,59*
Serious Statistical Software	*14*
Silicon Vision	*42*
Skyfall	*75*

S-BASE

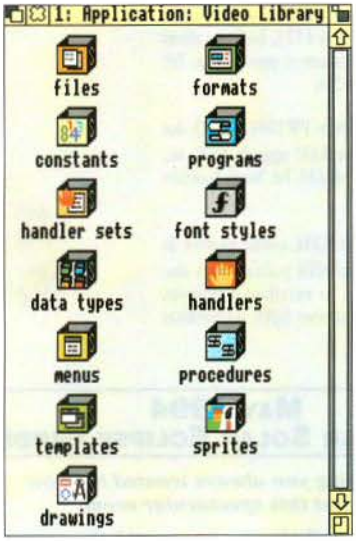


From stock control to accounting, from library management to customer information, *S-Base* is a programmable, fully relational database management system, which makes the development of high quality, customised, database applications quick and easy.

S-Base provides a state-of-the-art, WIMP-based, integrated development environment. At its heart is the S language, a high level database programming language, with over 300 commands and functions. In addition, powerful program editors, a style-based template editor, an intelligent screen layout editor and a multifile database designer, ensure that design, programming and testing can all be carried out within the *S-Base* environment.

Using *S-Base*, you can create highly customised applications with minimal programming effort. A simple, card-based multi-tasking application can be created with only a few lines of code; a large, complex, high performance system can be reliably engineered in the shortest time.

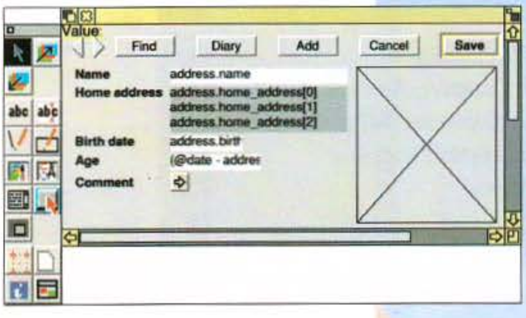
S-Base is available in three versions: *S-Base Personal*, *S-Base Developer* (which may be used to create compiled applications for sale) and *S–Base Developer Plus* (for creating networked, multiuser applications).



RESOURCES

An *S-Base* application is made up from a number of 'resources'. For example, the 'Files' resource defines how data is to be stored; the 'Templates' resource creates a window, with icons and buttons; the 'Formats' resource displays database information in the window.

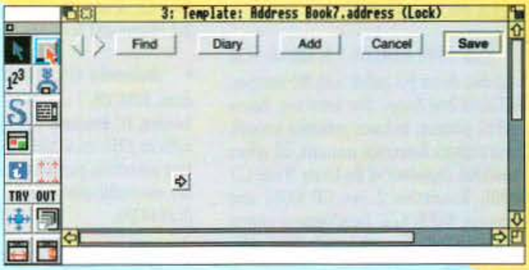
You can copy useful resources from the example applications provided, or from applications you have written, then modify them to fit your new application. *S-Base* copies related resources automatically.

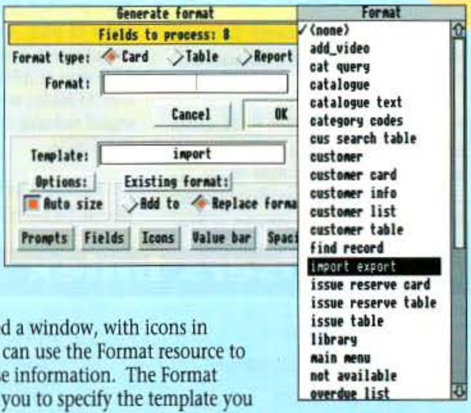


Name address.name
Home address address.home_address[0]
address.home_address[1]
address.home_address[2]
Birth date address.birt
Age (@date - addres
Comment

TEMPLATES

An important part of creating a data application is the design of the windows and icons. *S-Base* provides a comprehensive window designer to ensure that your applications are consistent with other RISC OS based software and have a professional look.



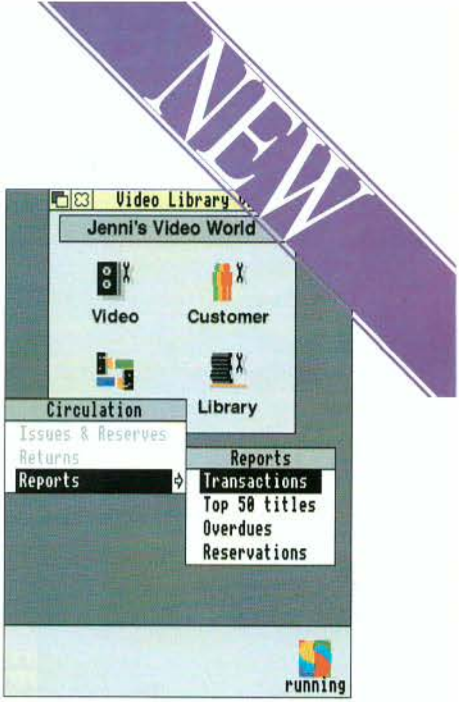


Fields to process: 8
Format type: ● Card ○ Table ○ Report
Format:
Template: import
Options: ☑ Auto size
Existing format: ○ Add to ● Replace forma

FORMATS

Having created a window, with icons in position, you can use the Format resource to insert database information. The Format dialogue asks you to specify the template you want to use (by name) then switch on the various format elements — prompts, fields, icons, value bar, spacing. *S-Base* will then insert the correct number of fields, of the correct length, into the window, together with prompts derived from the field labels. This information can be re-positioned, and you can choose different fonts and colours to create an attractive screen display.

THE PROGRAMMABLE RISC OS RDBMS



INTEGRATION

S-Base provides an interpreted, completely interactive environment in which to develop your application. Whenever an error occurs, *S-Base* immediately displays the object that caused the error, in a suitable editor, so that you can inspect and modify it.

Once your application is completed, and tested, *S-Base* Developer will compile it into a compact, distributable binary file, which cannot be edited by your users.

For the beginner, *S-Base* is supplied with a number of 'shell' applications which can be modified and extended with very little technical knowledge.

FLEXIBLE DATA HANDLING

An *S-Base* application can incorporate menus, dialogues, tables and multi-choice selectors — whatever data entry method is most suitable for your users. The format layout editor makes it easy to assemble and link these elements together into an integrated design, and *S-Base* checks everything you do for consistency, reducing the possibility of frustrating mistakes.

Besides text (in any outline font style), cards, reports and tables can include drawings or sprites. Reports can be produced in virtually any format, including multi-column text, address labels, ID cards, stock catalogues, etc.

HIGH SPEED

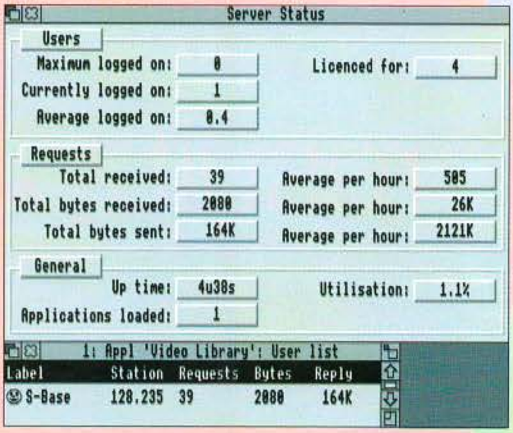
S-Base is designed to handle large volumes of data at speeds acceptable to the user: An *S-Base* application can process very large files, containing many thousands of records, in seconds, updating the screen as fast as a C program written by an expert.

Whereas a typical database can take up to five minutes to add 500 records to a file with five indexes (since the indexes must be updated after each record), *S-Base* can add 5000 records in under one minute (timed on an A5000), by performing the re-indexing later.

S-Base places no limits on the number of files you can open at once. Your application can compare, process and display data from dozens of different files with no difficulty.

NETWORKED AND MULTI-USER APPLICATIONS

S-Base Developer Plus can be used to create applications that operate as multi-user systems over a network — where the combination of a smart database server, and highly optimised data exchange protocols, ensures high speed operation, even over Econet. Operation over the network is completely transparent to both the user and the developer.



```
Server Status
Users
   Maximum logged on:  0        Licenced for:   4
 Currently logged on:  1
   Average logged on:  0.4
Requests
      Total received:  39       Average per hour:  505
Total bytes received:  2080     Average per hour:  26K
    Total bytes sent:  164K     Average per hour:  2121K
General
            Up time:   4u38s    Utilisation:    1.1%
Applications loaded:   1

1: Appl 'Video Library': User list
Label       Station  Requests  Bytes  Reply
S-Base      128.235  39        2080   164K
```

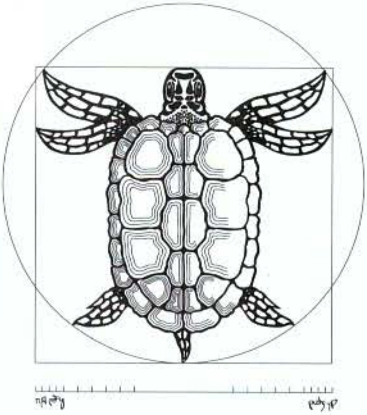
The multi-tasking S-Base server application, S-Net, is independent of the network file server and can run on any network machine. A single S-Net server can offer any number of applications across the network, so a 2 Mb machine can serve several clients running different applications. Client machines can present a menu of applications available on the network or can be configured to locate the required application automatically.

Applications designed for network operation will run on a stand alone machine without modification.

Single User Prices

S-Base Personal	£99.00
S-Base Developer	£199.00
S-Base Developer +	£299.00

For *S-Net*, and education and business site licence prices, or for further product information, please contact us.



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more news from Colton Software

New from the Archimedes' spreadsheet experts comes Resultz, the ultimate spreadsheet for RISC OS.

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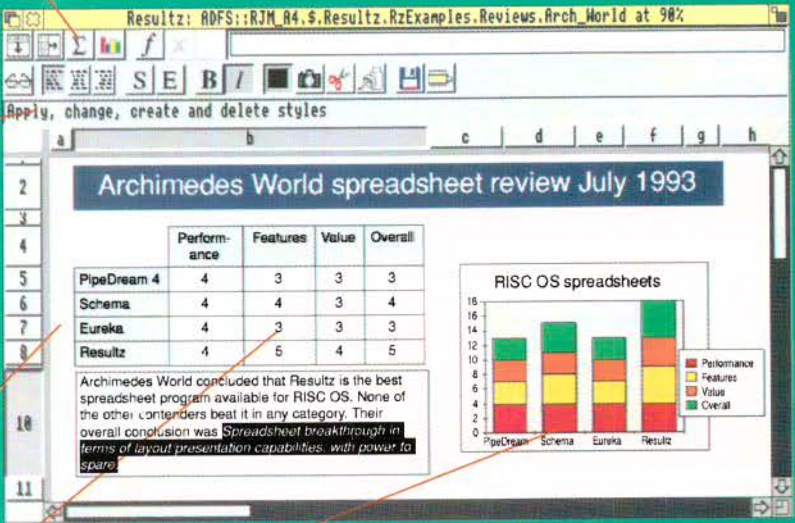
It recalculates faster than any competitor, and uses background recalculation so that you're never waiting for the computer to catch up. It will automate your work with the *Fill* and *Autosum buttons* - just select a group of numbers and Resultz writes a formula which adds them up automatically.

Resultz isn't just for power users. It's designed to help novice users work productively. Interactive help makes it easy to use Resultz' comprehensive set of functions. Every time you pick one of the 190 built-in functions from the selector, *tips on using it appear on screen.*



Resultz: ADFS::RJM_A4.$.Resultz.RzExamples.Reviews.Arch_World at 90%

Apply, change, create and delete styles

Archimedes World spreadsheet review July 1993

	Performance	Features	Value	Overall
PipeDream 4	4	3	3	3
Schema	4	4	3	4
Eureka	4	3	3	3
Resultz	4	5	4	5

Archimedes World concluded that Resultz is the best spreadsheet program available for RISC OS. None of the other contenders beat it in any category. Their overall conclusion was *Spreadsheet breakthrough in terms of layout presentation capabilities, with power to spare.*

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Unlike other spreadsheets, Resultz shows your pages on screen, so what you see on screen is exactly what will print out on the page (we call it *spreadsheet DTP*). The style editor places fonts and formats at your fingertips. It's easy to build *tables* and *forms*, and to add *charts* or *pictures* to worksheets.

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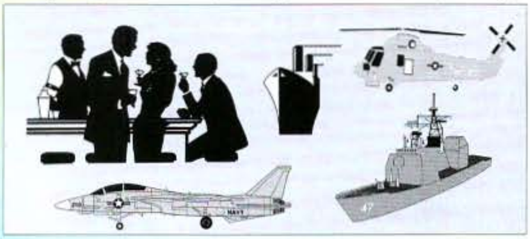

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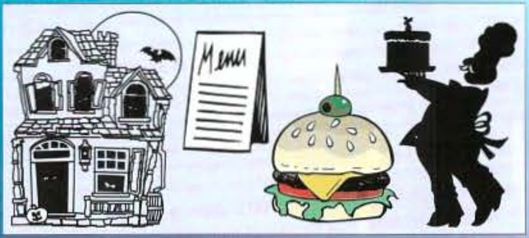

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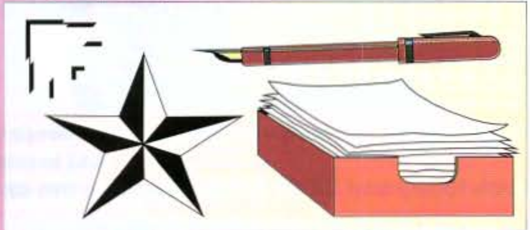

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